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SEVERE, SPORADIC VIRUS PNEUMONIAS

Diagnostic and Therapeutic Problems

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Interest in virus pneumonia, judging by the few papers recently published on the subject, has waned since the War years when the disease was prevalent. The virus cause still is unproved, but the name virus pneumonia is used in preference to the ambiguous term atypical pneumonia. Any pneumonia, regardless of cause, whose characteristics differ from classic lobar pneumonia is atypical.

According to a suggestion once made, virus pneumonia was the underlying process of most bacterial pneumonias. With the decline induced in the number of bacterial pneumonias particularly by sulfonamide compounds after 1939, virus pneumonias supposedly were unmasked or were left over, so to speak, after removal of the bacterial superinfection and thus were recognized and came into prominence. Such, however, was not the case. The increase in the incidence of virus pneumonias was real. The epidemics of mild disease of the respiratory tract, of which virus pneumonias represented the severest forms as reported in 1938 [1] and 1939,[2] were forerunners of the pandemic of 1941-1943. Pneumonia was present in 10 per cent of such cases and outnumbered pneumococcic pneumonias in the proportion of four to one.[3] Similar outbreaks have not occurred since then, but like other epidemic diseases they probably will recur in the future. At present, in hospital practice, pneumococcic pneumonias predominate as usual.

Apparently apart from the epidemic forms just mentioned, there occur severe, sporadic, nonseasonal virus pneumonias in the absence of other cases of mild disease of the respiratory tract. Multiple pneumonic cases may occur simultaneously or in succession in family groups.[4] Whether the epidemic forms and the sporadic forms are etiologically the same still cannot be said, since the cause of neither is known. Clinically, they are identical as described in the first presentation of the subject,[1] to which little has been added since.[5] In Frugoni's [5a] opinion, there may be a difference pathologically; in the epidemic form, primarily a disease of the respiratory tract, the epithelial lining is chiefly affected; in the severe sporadic form, a systemic disease with pulmonary manifestation, involvement of the interstitial tissue predominates.

Sporadic virus pneumonias continue to appear at irregular intervals and give rise to the same diagnostic difficulties as in the first cases described. To complicate the diagnostic problem, virus pneumonia not only may be confused clinically with pneumococcic atypical pneumonia, pulmonary tuberculosis, typhoid and psittacosis but also may resemble Q fever, ornithosis, coccidioidomycosis and histoplasmosis, which were not even considered before 1939. All of them may have the indistinguishable clinical characteristics of atypical pneumonia. Furthermore, since sporadic virus pneumonia often appears to be a severe systemic disease with incidental pulmonary involvement, diagnosis is especially difficult when the lungs are involved minimally or, in rare cases, not at all.[6] Early etiologic diagnosis of the atypical pneumonias listed is of importance to govern the selection of the antibiotic agent most suitable for treatment and to regulate proper epidemiologic measures for the respective disease.

To illustrate diagnostic and therapeutic problems which involve this group of diseases the following cases of severe, sporadic virus pneumonias encountered in the past three years are selected for discussion.

REPORT OF CASES

CASE 1.—E. B., a girl aged 14 years, was well until Feb. 17, 1947, when at school she felt chilly and in the evening began to cough but raised no sputum. Coughing became worse together with malaise, headache and smarting of the eyes. The temperature was said to have been high, and one shaking chill occurred. Her physician diagnosed the condition as pneumonia in the left lung and ordered that sulfadiazine be given the girl about the ninth day of disease. After two days of treatment she failed to improve and became deeply cyanotic. Cyanosis was attributed to sulfonamide therapy, and penicillin was substituted. There was severe nocturnal sweating. Because she became alarmingly worse and the pneumonic process spread to the right lung, she was sent to the hospital on the fourteenth day of disease with the tentative diagnosis of miliary tuberculosis.

On admission the child was deeply cyanotic, but despite fever (102 F. [39 C.]) and tachycardia (130) she did not appear to be very ill. The conjunctivas, tympanums, nasal and pharyngeal mucous membranes were injected. The tongue was heavily

From Jefferson Medical College and Hospital.

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coated. Rales and harsh breath sounds were heard throughout both lungs. A roentgenogram showed diffuse small nodular mottling generally, suggestive of acute miliary tuberculosis. The leukocytes numbered 14,000 and 19,000 with 75 per cent polymorphonuclear cells on the fourteenth and fifteenth days, respectively, but soon dropped to 8,000. The red blood cell sedimentation rate was 23 mm. in forty minutes. The temperature rose to 104 F. (40 C.), the pulse rate to 140, and the respiratory rate to 40 per minute (fig. 1).

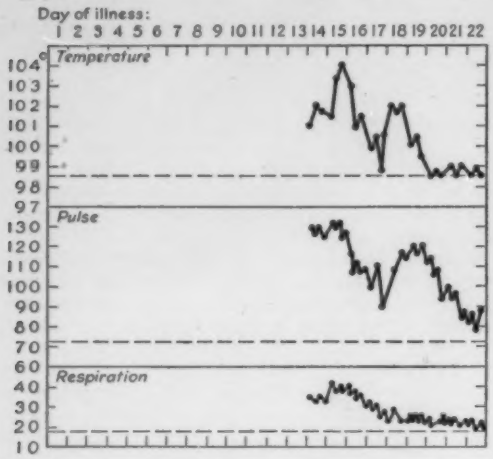

Fig. 1 (case 1).—Last few days of severe virus pneumonia mistaken at first for miliary tuberculosis. Tachycardia and tachypnea are striking.

Because of the high fever, tachycardia, tachypnea, cyanosis, sweating, physical signs, leukocytosis and roentgenographic evidence, miliary tuberculosis seemed the likely diagnosis and streptomycin, 0.5 Gm., was given intramuscularly every four hours as an emergency measure. However, virus pneumonia was suspected because of the comparative well-being of the patient, the absence of evidence of contact with tuberculosis, the presence of a monocytic cell exudate in the pharynx, conjunctival injection and only a slightly increased sedimentation rate. The cold agglutinin test was positive in dilution of 1:2,056 eighteen hours later. Streptomycin therapy was stopped, the roentgenogram showed rapid clearing of the densities, and the temperature declined and reached normal on the twentieth day.

Although the nature of the onset and early course were those of virus pneumonia, the alarming signs and roentgenographic shadows resembled those of miliary pulmonary tuberculosis so much that streptomycin was given. However, the unusual well-being of the patient, the development of cold agglutinin in the blood and prompt recovery led to the diagnosis of virus pneumonia. Neither sulfadiazine nor penicillin were indicated at the onset.

Case 2.—R. B., a physician aged 27, was in good health until Jan. 3, 1948, when he had a chilly sensation for several minutes. He continued to work until evening of the next day, when his temperature was 101 F. (38.3 C.) and he was obliged to go to bed. The temperature rose to 104 F. (40 C.); there was backache and aching of his limbs but no cough until the fourth day. Cough was occasional and dry. He was given penicillin and sulfadiazine without effect and entered the hospital on the sixth day of disease with his condition diagnosed as fever of unknown cause.

On examination he looked sick and perspired profusely. The pharynx was reddened, but there was no cough and no abnormal signs in the chest. Roentgenographically there was a dense shadow in the lower lobe of the left lung. The temperature fluctuated between 102 and 103 F. (38.9 and 39.5 C.) and the pulse rate between 80 and 90. The leukocytes numbered 8,000 on two occasions, with the component cells in normal proportions. A blood culture was sterile. A tentative diagnosis of virus pneumonia was made, but there was no cold agglutinin present on the tenth day of the disease or two weeks later.

On the tenth day weak bronchophony and bronchial breathing were heard in a small area in the left lung base, but the roentgenographic shadow stayed the same. Recovery occurred on the eleventh day. At this time the patient recalled that a pigeon defecated on his head two weeks before the onset of disease, which raised the question of ornithosis. However, serum taken on the eleventh day and again two weeks later failed to fix complement in the presence of psittacosis antigen as tested by Dr. Dorland Davis of the National Institutes of Health.

The history and other data in this case are typical of virus pneumonia, especially the delayed signs of pulmonary involvement. Penicillin and sulfadiazine were given unnecessarily. The doubt raised later as to the possible role of ornithosis was temporarily distracting.

Case 3.—L. M., a man aged 28, had a cold which disappeared on Jan. 21, 1948. His infant son had severe tracheobronchitis at the time. On January 23 the patient noted malaise and had a series of chilly sensations followed by fever and profuse sweating. Fever ranged between 99 and 103.5 F. (37.2 and 39.7 C.) for the next five days. The symptoms gradually increased with anorexia, headache, postorbital pain and photophobia. Cough appeared on the third day, but little or no sputum was raised. Fever rose to 104.5 F. (40.3 C.), and the patient entered the hospital on the fifth day of disease (fig. 2).

On admission he appeared exceedingly ill. The fever was high and remittent, reaching 105 F. (40.5 C.), with relative bradycardia averaging 90 beats per minute and tachypnea. The pharynx but not the conjunctivas or the nasal mucosa was reddened. There were no abnormal signs in the lungs, heart and abdomen. The leukocyte count for the first three days varied from 5,600 to 7,000 with about 45 per cent polymorphonuclear cells, 52 per cent lymphocytes and a few mononuclear cells. Blood culture was sterile. Cold agglutination did not occur, and heterophil agglutinin tests on the twenty-seventh and thirty-second days gave negative results. A physician suggested the diagnosis of miliary tuberculosis, but skin tests with the first and second strength of purified protein derivative tuberculin gave no reaction. The sedimentation rate increased slightly in rate to 25 mm. in fifty minutes. The temperature declined steadily after the nineteenth day, but fever was still remittent. The pulse rate persisted at an average of 90 per minute. Rales appeared in the right lung base, and increased density was seen in a roentgenogram in that region. The temperature became normal on the thirty-second day of disease. Since the patient had lived in Texas the year before, diagnosis of Q fever and coccidioidomycosis was considered, but the

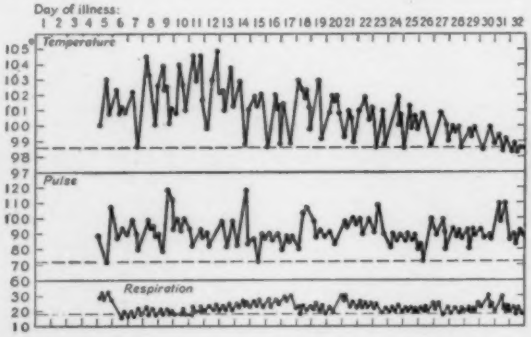

Fig. 2 (case 3).—Virus pneumonia lasting thirty-two days. High, remittent fever and relative bradycardia suggest typhoid.

complement fixation tests for Q fever and psittacosis (National Institutes of Health) and for coccidioidomycosis (Dr. C. Smith, Stanford University School of Medicine) gave negative results.

In this prolonged case lasting thirty-two days, contact with infection of the respiratory tract in another patient and the early signs and symptoms were characteristic of virus pneumonia. Yet the course, signs and duration suggested typhoid to one physician and tuberculosis to a second; the lymphocytosis suggested infectious mononucleosis to a third. The patient's sojourn in a region where Q fever and coccidioidomycosis are endemic made it necessary to rule out both despite the length of intervening time.

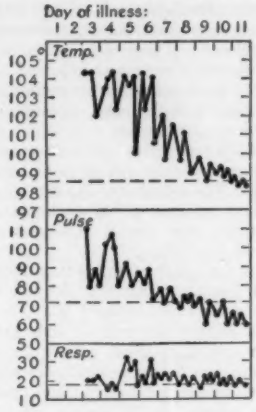

Fig. 3 (case 4).—Virus pneumonia of ten days' duration.

CASE 4.—I. P., a man aged 38, was well until Jan. 14, 1948, when he noted generalized aching and weakness. He continued working until evening, when there was a shaking chill, fever and cough productive of a small amount of brown sputum. He went to bed and for the next two days had repeated chills, profuse sweating, little cough and almost no sputum. On the third day, because of severe headache, dyspnea, cyanosis and relative bradycardia of 80 with fever (104.5 F. [40.3 C.]) typhoid was suspected and he was sent to the hospital. His physician had given him streptomycin for possible typhoid and penicillin for possible pneumonia.

On examination his face was flushed and dry and the conjunctivas, nasal mucosa and pharynx were reddened. He was restless, coughed frequently and raised a small amount of rusty sputum. The pulmonary resonance was impaired, and a few rales were audible in an area corresponding with the right middle lobe. The leukocytes numbered 15,000, 80 per cent of which were polymorphonuclear cells. The sedimentation rate was 20 mm. in sixty minutes. Sputum culture exhibited the usual oral flora, and a blood culture was negative. A roentgenogram showed increased density of the right middle lobe.

I saw the patient on the fifth day of disease when he had become dyspneic and cyanotic enough to need oxygen therapy. There was profuse perspiration at times. There were signs of congestion in the right middle lobe. A pharyngeal smear showed desquamated epithelial cells, a few of which contained inclusion bodies, and a mononuclear cell exudate. A diagnosis of virus pneumonia was made.

The temperature was 104 F. (40 C.) and irregular, the pulse relatively slow, 90, and the respiratory rate 20 per minute (fig. 3). Another chill occurred. Rales were present now throughout the right lung. The leukocyte count was 16,000. Gradual improvement ended in recovery on the tenth day. There was no cold agglutination nor complement-fixing antibody for psittacosis antigen (National Institutes of Health) demonstrable on that day or ten days later. A roentgenogram on the eleventh day showed increased density in the whole right lung field, indicating a spread of the pneumonia, but by this time the patient was well.

The gradual onset of the disease in this case together with high fever, severe headache, bradycardia and severe illness resembled typhoid and was regarded as such until after the patient's admission to the hospital, where leukocytosis and a pneumonic shadow were found. The latter data together with dyspnea, cyanosis, cough and rusty sputum suggested pneumonia of bacterial origin and induced his own physician to give both penicillin and streptomycin without effect. The pharyngeal exudate composed of mononuclear cells suggested a virus infection.

CASE 5.—E. R., a woman aged 63, had virus pneumonia in December 1945, with roentgenographic mottling of both lungs, 10,000 leukocytes and a sedimentation rate of 35 mm. in forty minutes. This infection was ineffectively treated with sulfadiazine and lasted six days. A similar attack affecting the lower lobe of the right lung occurred in October 1946. Both attacks were observed at this hospital.

The patient began to cough on Jan. 5, 1948. Coughing became worse and was accompanied with a small amount of white sputum. For the next seven days the temperature hovered between 99 and 101 F. (37.2 and 38.3 C.). Rales appeared in the lower lobe of the right lung. Her physician gave her 100,000 units of penicillin every eight hours orally. There was no improvement, and on the ninth day a shaking chill was followed by fever (104 F. [40 C.]). She entered the hospital on the tenth day of disease.

The patient appeared extremely ill and cyanotic, and the alae nasi flared at inspiration. The temperature was 104 F. (40 C.), the pulse rate between 90 and 100 and the respiratory rate 32. The conjunctivas were deeply injected and the pharynx reddened. There was occasional cough productive of a small amount of sputum. Over the left lung base posteriorly there were weak bronchial breath sounds, faint egophony and many rales, consistent with roentgenographic density in this area.

The leukocytes numbered 22,000, 88 per cent of which were polymorphonuclear cells, and the sedimentation rate was 35 mm. in thirty-five minutes. The sputum examination showed the usual oral flora with a predominance of nonhemolytic streptococci. The next day the leukocytes numbered 10,000. There was no cold agglutination demonstrable on the tenth day or eight days later. Blood culture was sterile. Study of the pharyngeal exudate showed desquamated epithelial cells, mononuclear cells and few bacteria. On the tenth day a pneumonic patch appeared in the lower lobe of the right lung.

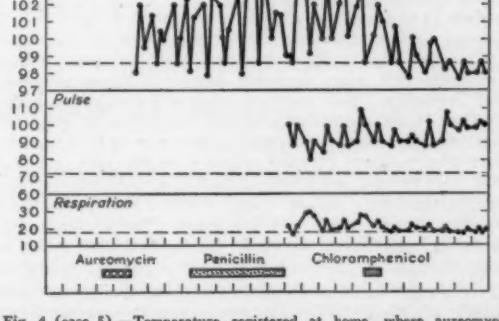

Fig. 4 (case 5).—Temperature registered at home, where aureomycin and penicillin were given, and at the hospital after the fifteenth day. High remittent fever and relative bradycardia suggestive of typhoid are present.

Because her physician had begun penicillin therapy and because of the possibility of a bacterial pneumonia as suggested by the shaking chill, the flaring alae nasi, leukocytosis and rapid sedimentation rate, and because of the patient's age, penicillin was given intramuscularly, 200,000 units every twelve hours for three days. The temperature remained high until the eleventh day, when it began to decline and reached normal on the sixteenth day. Because of the lack of evidence of a bacterial cause, the history of previous attacks of virus pneumonia and the gradual onset of the present attack, its duration, bradycardia, conjunctival and pharyngeal injection and the mononuclear cell pharyngeal exudate, diagnosis of virus pneumonia was made.

The history of previous attacks of similar disease diagnosed as virus pneumonia, the gradual onset, symptoms and signs, and a pharyngeal exudate of mononuclear cells favored a similar diagnosis. Yet the patient's age, the severity of the illness and leukocytosis warranted penicillin therapy lest a bacterial pneumonia atypical in nature be present. Recovery on the sixteenth day probably was spontaneous.

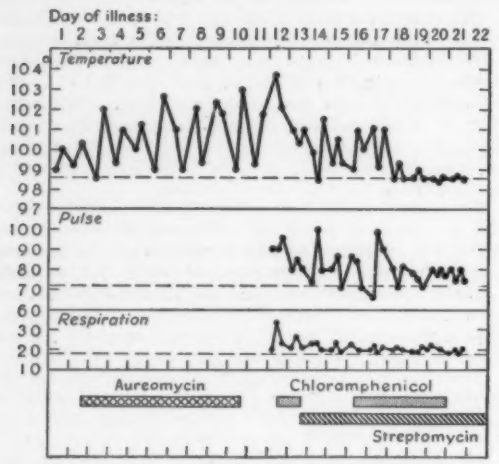

Fig. 5 (case 7).—Virus pneumonia suspected because of (1) contact of patient with persons having colds, (2) gradually increasing fever with sweating, (3) relative bradycardia and (4) recovery after eighteen days. Yet Mycobacterium tuberculosis was found in the sputum and the upper lobe of the right lung, affected by tuberculosis fifteen years before, was involved.

Case 6.—Mrs. C. H., a housewife aged 66, was well until September 1949, when she noted malaise, weakness, fatigability and irritability. She recovered after a few weeks, but about October 14 she contracted what was thought to be grip. Her legs ached and there was cough. There was no fever, and four days later a painful eruption appeared on the right side of the nose with redness and edema spreading upward and surrounding the right eye. It was thought to have been herpes zoster. Vesicles formed which later left scars. The woman received penicillin from October 21 to 26. She spent a week in bed and then resumed her household duties. After she had been feeling well for about ten days, the cough (which had persisted) became worse, nonproductive and paroxysmal about November 12. Fever of 100 to 102 F. (37.8 to 39 C.) appeared, and two chills of thirty minutes' duration occurred. In the next few days she perspired so profusely at times as to wet the bed clothing. Severe headache was the chief complaint. There were frequent chilly sensations.

On November 16 aureomycin hydrochloride was given orally in doses of 1 Gm. every six hours (fig. 4). After the first day the dose was reduced to 0.25 Gm. every six hours and finally discontinued because of severe nausea and vomiting. A total of 7.5 Gm. was given. There was no beneficial effect. Penicillin was given from November 19 to 24, 300,000 units daily. On November 24 tympanites and diarrhea developed, with five to twelve stools a day for a week. She was admitted to this hospital on November 27, which was about two months after the first indisposition was noted and fifteen days after the onset of fever and severe cough. The temperature was 104 F. (40 C.), the pulse rate was between 80 and 100 and the respiratory rate 20 to 30 (fig. 4). She was dyspneic and slightly cyanotic. She appeared to be extremely ill. Her conjunctivas were edematous but not injected, and the throat was slightly reddened. There were rales in both pulmonary bases, and the percussion note was impaired over the left base. The abdomen was distended. A roentgenogram showed density in the lower lobes of both lungs, greater in the left. The diagnosis was virus pneumonia.

There were 4,000 leukocytes on two occasions with 40 per cent polymorphonuclear cells and 60 per cent lymphocytes and mononuclear cells. The sedimentation rate was slightly increased to 24 mm. in sixty minutes. Cold agglutination did not occur and a blood culture was sterile. Cultures of a liquid stool revealed the usual fecal flora.

During the first four days of observation the diarrhea stopped, the temperature fluctuated between 100 and 104 F. (37.8 and 40 C.), and the pulse rate averaged 90. The respiration rate was about 24 per minute, yet dyspnea and cyanosis were severe enough that the patient required oxygen therapy.

Although a diagnosis of virus pneumonia was made, suspicion was about 24 per minute, yet dyspnea and cyanosis were severe to influence the course, by the absence of cold agglutination, leukopenia, the diarrhea and the history of having eaten raw oysters about October 1, twelve days before the onset. However, a blood culture and stool culture did not contain Salmonella typhosa, and a Widal test gave a negative result. There was no evidence of known contact with typhoid or with sources of psittacosis, ornithosis or Q fever. Complement fixation tests for the last three diseases on blood taken three days after recovery and again ten days later gave negative results as tested at the Communicable Disease Center, Chamblee, Ga. Rales persisted in both lung bases, and weak bronchophony was heard in the lower lobe of the left lung. A pleuropericardial friction rub was audible near the sternum. A roentgenogram showed clearing of the right base and lessened density in the left, with a small amount of fluid. Because of the possibility that the disease might have commenced two months before and relapsed, and because of the eruption on the nose, pleuropericardial friction and leukopenia, question of lupus erythematosus disseminatus arose.

On the seventeenth day the leukocytes numbered 10,500, with 53 per cent polymorphonuclear cells. A heterophil antibody test gave a negative result, as did a cold agglutination test on the nineteenth day. Chloramphenicol was given to the patient on the twentieth day, 0.5 Gm. four times daily, but after the fourth dose severe vomiting occurred and the dosage was stopped. The temperature, which had begun to decline the day before (fig. 4), continued to do so and became normal on the twenty-fourth day.

Although the diagnosis was virus pneumonia, various factors suggested other possibilities as well. It was uncertain whether the actual disease began two months or two weeks before admission to the hospital. The possibility of typhoid and psittacosis arose as in the other cases, and even lupus erythematosus disseminatus was considered. But the characteristics of virus pneumonia persisted and the favorable outcome supported the diagnosis. Aureomycin had no effect, and cold agglutination did not occur.

Case 7.—R. C., a man aged 44, about Nov. 29, 1949, one week after his daughter and his wife each had a cold with fever and coryza which lasted several days, noticed mild sore throat which lasted until December 5. Then he had a slight chill, followed by hoarseness, malaise, cough, fever, coryza and profuse sweating. Aureomycin hydrochloride was taken in doses of 0.25 Gm. every six hours daily for nine days without effect, other than causing diarrhea (fig. 5). Fever, which was

remittent, now rose to 103 F. (39.5 C). Because the patient in 1934 had had tuberculosis in the apex of the left lung, which healed after three months of bed rest, it was uncertain whether the patient now had an infection of the respiratory tract contracted from his family or a recurrence of tuberculosis.

He entered the hospital about twelve days after fever began or twenty-three days after the sore throat was first noticed. He did not look ill but was hoarse, had paroxysms of severe cough with small amounts of sputum and, at times, drenching perspiration. The pharynx was reddened and the conjunctivas were injected. There was headache and general aching. There were slight impairment of resonance and slightly increased breath sounds in the upper lobe of the left lung. The temperature was 103.6 F. (39.8 C.), the pulse rate 90 per minute and the respiratory rate 30. The leukocytes numbered 7,000, the sedimentation rate was 25 mm. in thirty minutes. Roentgenologic examination showed diffuse infiltration of the upper lobe of the left lung. Because of the exposure to the colds in his family, the onset with sore throat, the relative well-being, the bradycardia and the normal leukocyte count, virus pneumonia was suspected, and he was given chloramphenicol in doses of 1 Gm. daily. The day afterward, diarrhea with six liquid stools occurred. At this time also sparse acid-fast bacilli were discovered in the sputum. Chloramphenicol therapy was stopped, and streptomycin, 0.5 Gm. intramuscularly twice daily, was then ordered. It was uncertain whether virus pneumonia had reactivated pulmonary tuberculosis or acute tuberculous pneumonia was present. Therefore both streptomycin and chloramphenicol were given (fig. 5). The temperature and pulse rate declined and reached normal on the eighteenth day. Abnormal sounds were not audible in the chest, and a roentgenogram made on the twenty-fourth day showed an intensification of the shadow of the upper lobe of the left lung and evidence of atelectasis of the lobe. It was still uncertain whether the pneumonia was primarily virus in origin and had reactivated tuberculosis or whether tuberculous pneumonia was the sole cause and was controlled with streptomycin. The patient's well-being, relative bradycardia and prompt recovery was more compatible with a virus infection, but the past history, the area involved and the presence of Mycobacterium tuberculosis in the sputum made a diagnosis of tuberculosis inescapable. Cold agglutination was not demonstrated, there was no response to aureomycin, and the effect of chloramphenicol was doubtful. The patient was sent to a sanatorium, where his convalescence was satisfactory. The dense shadow in the upper lobe of the left lung began to diminish after a month.

COMMENT

These cases illustrate diagnostic and therapeutic problems which arose in severe sporadic virus pneumonias encountered at widely spaced intervals. While all 7 cases have enough features in common to suggest a nosographic entity, different circumstances in each gave rise to different diagnostic problems. In case 1 tuberculosis was considered; in case 2, ornithosis; in case 3, typhoid, infectious mononucleosis, coccidioidomycosis and Q fever; in cases 4 and 6, typhoid; in case 5, pneumococcic atypical pneumonia, and in case 7, virus pneumonia was suspected but tuberculosis was present, probably reactivated by virus pneumonia. The problem of differentiating early pulmonary tuberculosis and pneumonia often occurs.[6a]

Five patients had no apparent exposure to persons with minor infections of the respiratory tract, but 1 had been exposed to an infant with tracheobronchitis and 1 to family members with colds. All had a mild onset with predominant constitutional symptoms and pneumonia lasting ten to thirty-two days with cough, headache, profuse sweating, delayed signs of pneumonia, conjunctival and pharyngeal injection and a slightly increased sedimentation rate. The pharyngeal exudate examined in 3 instances contained a predominance of mononuclear cells, said to be demonstrative of a virus rather than a bacterial infection, in which the exudate is composed chiefly of polymorphonuclear cells. Cold agglutination occurred only in case 1. Six patients had relative bradycardia, and 4 had a normal leukocyte count early in the course. These observations are characteristic of virus pneumonia but also of psittacosis, Q fever, influenza, occasionally of pneumococcic atypical pneumonia, and of the early stage of typhoid, tuberculosis and coccidioidomycosis. Each of these diseases was considered at some time during the course of the disease of the patients described. Histoplasmosis, erythema multiforme exudativum, infectious mononucleosis, Löffler's disease, tularemic and rheumatic pneumonia also may resemble virus pneumonia. Diagnosis of each of these diseases usually can be made as their characteristics evolve and by appropriate tests and epidemiologic data. In the early stages when specific therapy is so effective, prompt diagnosis is imperative but may be difficult. Unfortunately, diagnosis of virus pneumonia itself is made chiefly by exclusion. Cold agglutination of erythrocytes seldom occurs before the tenth day, and then in only about half of the cases. Perhaps in the cases reported herein undue stress was placed on the consideration of uncommon diseases in differential diagnosis, yet severe sporadic virus pneumonia is not a common disease either and often mimics the entities listed.

When a diagnosis of virus pneumonia is made and when diagnostic facilities are at hand for etiologic recognition of the other diseases mentioned, there is no justification for the routine administration of penicillin or sulfadiazine. However, when there is question of the existence of coccic pneumonia these agents may be used, but administration should be discontinued if they are ineffective after forty-eight to seventy-two hours. The problem seems to be simplified by the introduction of aureomycin, which is useful in pneumococcic pneumonia, Q fever, psittacosis, influenzal pneumonia[7] and in some but not all cases of virus pneumonia.[8] For the sake of accuracy and knowledge it is desirable to establish an exact diagnosis in all cases. Diagnosis is especially important for epidemiologic reasons, lest typhoid or tuberculosis be the cause. Furthermore, chloramphenicol is specific for typhoid and streptomycin for tuberculosis.

SUMMARY

Over a three year period 7 patients were studied who had severe virus pneumonia in which differential diagnostic problems arose. Similar problems will recur until the cause of virus pneumonia is clarified and diagnostic tests are formulated. Pneumonias caused by known agents usually can be recognized promptly if the appropriate historic, epidemiologic, etiologic, serologic and clinical information is properly assembled. Diagnosis is important because a number of entities are amenable to specific treatment with different antibiotic agents.

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DIABETIC COMA

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Are alkalis, plasma transfusions and potassium preparations necessary in the treatment of severe diabetic coma if adequate insulin dosage and isotonic saline solution are promptly given? Simplification of methods and avoidance of delay in diagnosis and treatment are essential. We might almost have been persuaded of the value of alkaline solutions of bicarbonate or lactate by a recent instructive report by Duncan [1] of a case of severe coma, had not the patient, recently treated at the Deaconess Hospital, exemplified recovery without the use of alkali, transfusions or potassium preparations.

REPORT OF A CASE

Mrs. B. F., aged 31 years, entered the New England Deaconess Hospital in a diabetic coma at midnight Nov. 12, 1949. The onset of diabetes mellitus was in 1927, when she was 9 years old, and insulin therapy was started then. Her only child was born in 1942. Her usual daily dose was 40 units of crystalline protamine zinc insulin (NPH-50). Her early treatment for diabetes was carefully carried out, and during the first seven years her food was weighed daily and her urine was tested regularly. While at school and college she measured her food less frequently, and during the last five or six years she observed dietary rules only partially. Urine testing was done at irregular intervals, but insulin was taken constantly.

On Nov. 7, 1949, she vomited. Since others in the family also had a similar illness, the condition was regarded as "intestinal flu." On November 10, she took 10 extra units of insulin because of positive reactions to glycosuria tests. On the morning of November 12, she took her usual insulin but she vomited. By 4:30 p. m. she was drowsy and the vomiting had stopped. Drowsiness alternated with periods of excitement, and by 6 p. m. dyspnea began. She was unconscious by 9 p. m. and reached the hospital at midnight still unconscious, with marked Kussmaul respirations and a strong acetone odor to her breath. The temperature was 96 F. rectally. The pulse was weak and regular. A typical pulsus paradoxus was evident both by palpation of the wrists and by means of the blood pressure apparatus. The skin was dry and cool, and the tongue was shriveled and encrusted. The eyeballs were soft.

Urinalysis showed glycosuria (4 plus), diacetic acid (4 plus), a trace of albumin and occasional granular casts. On admission the blood sugar was 1,285 mg. per hundred cubic centimeters, blood carbon dioxide content was 2 milliequivalents per liter (4.4 volumes per cent) and nonprotein nitrogen 58 mg. per hundred cubic centimeters. The leukocyte count was 37,500 per cubic millimeter.

Immediately 50 units of crystalline insulin was given intravenously and 50 units subcutaneously. Isotonic saline solution was administered intravenously and subcutaneously. Although the abdomen was not distended, 600 cc. of yellow-green fluid was recovered by gastric lavage. At 1:15 a. m. 250 units of crystalline insulin was given intravenously and 150 units of crystalline insulin was given subcutaneously. Therefore, in the first one and a fourth hours, the patient received a total of 500 units of insulin. At 2 a. m. she responded somewhat and complained of extreme thirst. The blood pressure, pulse and temperature were unchanged. The respirations were 40 per minute and somewhat less labored. At 2:45 a. m. the blood sugar was 790 mg. per hundred cubic centimeters and the carbon dioxide content was still 2 milliequivalents. At 3 a. m. the level of the blood acetone bodies was 130 mg. per hundred cubic centimeters. At 4:15 a. m. 50 units of crystalline insulin was given intravenously and 200 units of crystalline insulin was given subcutaneously. At 5 a. m. the blood sugar was 710 mg. per hundred cubic centimeters and the carbon dioxide content of the blood was 12 milliequivalents per liter (26.4 volumes per cent). Pulsus paradoxus was no longer evident. At 6:30 a. m. she received 100 units of crystalline insulin intravenously and 100 units subcutaneously. By 7 a. m. the patient had improved enough that she was able to talk intelligently. Her temperature was now 98.6 F., but the pulse rate was still 120. Respirations were only 30 per minute. The blood pressure was 120 systolic and 68 diastolic. At 7:30 a. m. the blood sugar was 570 mg. per hundred cubic centimeters, and the carbon dioxide content was 15 milliequivalents per liter (33 volumes per cent). The hourly urine specimens continued to be brick red and give a 4 plus reaction for diacetic acid. In the first six hours of treatment the patient received a total of 950 units of crystalline insulin of which 450 units was given intravenously and 500 units subcutaneously. By 8 a. m. fluids and soft foods were administered by mouth so that the patient received approximately 10 Gm. of carbohydrate per hour. At 12 p. m. the blood sugar was 270 mg. per hundred cubic centimeters and she received 50 units of crystalline insulin subcutaneously. At the end of twelve hours she had received a total of 6,000 cc. of isotonic saline solution, 1,000 cc. of which was given subcutaneously, and the total urine output had been 1,500 cc. The total amount of crystalline insulin given at the end of twelve hours was 1,000 units. An electrocardiogram taken eight hours after therapy had begun was consistent with mild hypopotassemia (lowering of the T waves) and an electrocardiogram repeated twenty-four hours later showed restitution to normal. From 8 a. m. to 8 p. m. the patient received about 1,500 cc. of liquids by mouth, mostly in the form of orange juice. Consequently, she received a total of 2.3 Gm. of potassium in her food during this period. By 3 p. m. the urine tests were green and showed only a trace of diacetic acid. The blood sugar at 8 p. m. was 115 mg. per hundred cubic centimeters. At no time did the patient display any symptoms of hypoglycemia. On the following morning (November 13) the blood sugar was 148 mg. per hundred cubic centimeters, although the patient had received no additional insulin since the previous day at 12 noon. She was discharged on November 30, taking 44 units of crystalline protamine zinc (NPH-50) insulin.

TABLE 1.—*Comparison of Admission Data on 2 Patients with Diabetic Coma*

	Age	Duration of Diabetes	Duration of Coma, Hr.	Weight, Kg.	Blood Sugar, Mg./100 Cc.	Carbon Dioxide, Volume %	Rectal Temperature	Pulse Rate	Unconsciousness	Insulin Dose After Discharge, Units
Pennsylvania Hospital, Philadelphia.....	36	3 mo.	7	96	1,450	12	100	136	++++	0
New England Deaconess Hospital, Boston...	31	22 yr.	3	47	1,285	4.4	96	146	+++	44

This case illustrates several important points: (1) the rapidity with which diabetic coma can develop; (2) the importance of vigorous and ample insulin administration—note that one-half the total amount of insulin this patient received in twelve hours was given in the first seventy-five minutes (500 units); (3) the rapid clinical and laboratory improvement without the use of alkali; (4) the occurrence of pulsus paradoxus, a clinical observation infrequently reported in diabetic coma, and (5) the probable development of hypopotassemia

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1. Duncan, G. G.; Carey, L. S., and Hudson, M. T.: M. Clin. North America 33:1537, 1949.

and its treatment without the parenteral or oral use of potassium preparations.

Similarly, an instructive paper on the treatment of diabetic coma by Duncan, Carey and Hudson [1] records the case of a patient in severe coma treated with sodium lactate and large amounts of insulin and saline solution. The patient was an obese Negro woman aged 36 whose diabetes was of only three months' duration. She entered the Pennsylvania Hospital in profound coma, having been unconscious for at least seven hours. Severe dehydration and typical Kussmaul respirations were present. Table 1 summarizes a comparison of these 2 patients.

In table 1 it is to be noted that in each case excessively high blood sugar values were obtained and blood carbon dioxide values were low. However, considerable differences are apparent; in the Deaconess Hospital case the carbon dioxide was 4.4 volumes per cent,

TABLE 2.—*Treatment of 2 Patients in Diabetic Coma 12 Hour Totals*

	Insulin, Units	Isotonic Saline, Cc.	Racemic Sodium Lactate, Cc.	Plasma, Cc.	5 Per Cent Dextrose in Water, Cc.	Potassium Chloride	Urinary Output, Cc.
PENN.*	1,350	7,080	600	350	700	X	3,300
N.E.D.H.†	1,000	6,000	0	0	0	0	1,500

* PENN.—Pennsylvania Hospital, Philadelphia.
† N.E.D.H.—New England Deaconess Hospital, Boston.

TABLE 3.—*Comparison of Blood Sugars and Carbon Dioxide Levels in 2 Patients in Diabetic Coma*

	PENN.*		N.E.D.H.†	
Hours of Treatment	Blood Sugar, Mg./100 Cc.	Carbon Dioxide, Vol. %	Blood Sugar, Mg./100 Cc.	Carbon Dioxide, Vol. %
0	1,452	12	1,285	4.4
2	1,372	16	700	4.4
4	804	18	.....	....
5	.....	..	710	23.4
6	534	..	.....	....
7	.....	..	570	33
8	.....	33	.....	....
10	377	..	.....	....
12	291	..	270	....

* PENN.—Pennsylvania Hospital, Philadelphia.
† N.E.D.H.—New England Deaconess Hospital, Boston.

whereas the patient of Dr. Duncan had a carbon dioxide value of 12 volumes per cent. The difference in duration of diabetes is important. It is striking that in the patients with diabetes of long duration with onset in childhood, the patient is often more vulnerable and particularly liable to development of severe insulin resistance.

In table 2 is summarized the comparison of the treatments in the first twelve hours in the 2 patients. In their case 1,350 units of insulin was given, whereas our patient received 1,000. In their case 7,080 cc. of saline solution was used, together with an additional 600 cc. of sodium lactate solution, 350 cc. of plasma and 700 cc. of dextrose solution. Also, potassium chloride was used in their case. The urinary output in the patient at the Pennsylvania hospital was higher than seemed necessary when rehydration of the patient is an essential objective in treatment. As indicated in table 3, recovery of the patient at the Deaconess Hospital occurred at about the same rate as judged by the rise in carbon dioxide of the blood and the decline of blood sugar without the administration of lactate, plasma or potassium.

COMMENT

Diabetic coma is the end result of a deficiency—a deficiency of insulin. Guest [2] recently stated, " . . . the development of ketonemic acidosis is always initiated by insulin-insufficiency, regardless of the mechanism responsible for an increased need." It is obvious that the emphasis in treatment should center around insulin. Through the years at this clinic, the mortality from diabetic coma has progressively diminished as the amounts of insulin used early in treatment have progressively increased. In addition, whereas formerly we stressed the amount of insulin that should be given in the first three to six hours of treatment, we now believe the amount given in the first sixty to ninety minutes is of decisive importance. Certainly the prognosis of severe diabetic coma depends to a large extent on the amount of insulin given early in treatment. The two cases cited illustrate the desirable results of energetic and prompt administration of insulin in the treatment of severe diabetic coma. Rehydration and the early administration of food are the next objectives in treatment.

In their patient, Duncan, Carey and Hudson [1] used sodium lactate to relieve the marked degree of hyperpnea, and they commented on the remarkable effect it had on the carbon dioxide level. They wisely stated that the elevation of the carbon dioxide was probably artificial and that superficially this could be misleading in regard to the actual state of acidosis. To overcome this they advocate the use of the qualitative measurement of the plasma acetone. Others, particularly, Hartmann,[3] advocate alkali therapy on the assumption that recovery from coma is hastened. We do not use alkali for the following reasons: (1) it is unnecessary for clinical and chemical recovery, as shown by the fact that the mortality in the treatment of diabetic coma including all patients with complications such as pneumonia and coronary occlusion at the Deaconess Hospital has fallen to 3.4 per cent without the use of alkali; (2) there is potential danger of overuse; (3) the artificial elevation of the blood carbon dioxide content by alkali administration makes it difficult to recognize changes in the blood carbon dioxide which should follow the action of insulin on the formation and oxidation of ketone acids, and (4) isotonic saline solution has proved sufficient to relieve dehydration.

Hypopotassemia probably occurred in both patients, but they were treated differently. In regard to potassium, we feel that if the patient has been treated adequately with insulin and saline solution, without dextrose parenterally in the early phase of treatment, usually the tissue requirements for potassium can be supplied by the early feeding of liquids and foods that contain high concentrations of potassium. However, if there is clinical evidence of severe hypopotassemia, particularly the presence of respiratory difficulties, the administration of parenteral or oral potassium preparations may be necessary. If this is done, however, the possibilities of producing dangerous hyperpotassemia always should be kept in mind.

Finally, the use of dextrose in the early treatment of diabetic coma is condemned. Any antiketonemic effect of dextrose administration is far outweighed by the

2. Guest, G. M.: Am. J. Med. **7**: 630, 1949.
3. Hartmann, A. F.: Treatment of Severe Diabetic Acidosis: Comparison of Methods, with Particular Reference to Use of Racemic Sodium Lactate, Arch. Int. Med. **56**: 413 (Sept.) 1935.
4. Joslin, E. P.; Root, H. F.; White, P.; Marble, A., and Bailey, C. C.: Treatment of Diabetes Mellitus, ed. 8, Philadelphia, Lea & Febiger, 1946, p. 429.

marked dehydration it produces, illustrated in the reports of Franks and others[5] and Holler.[6] Holler's patient, age 18 years, received 9,000 cc. of dextrose solution in a total of 17,750 cc., and the twenty-four hour excretion was 15,325 cc. Especially noteworthy is the recent report by Lee and others[7] in which two series of cases of profound diabetic coma are compared. One group of 10 patients received 4.3 per cent dextrose solution in isotonic saline solution, and another group of 18 patients received only saline solution in the first four to six hours of treatment. The mortality was 40 per cent in the dextrose-treated group and only 11 per cent in the group treated without dextrose although both groups received nearly equal amounts of insulin.

CLINICAL STUDY OF PREVENTION OF ERYTHROBLASTOSIS WITH Rh HAPTEN

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Several investigators[1] have attempted the extraction of the essential Rh fraction which is undoubtedly present in human Rh-positive erythrocytes. More recently, Carter[2] prepared an extract, called it Rh hapten and claimed the following characteristics for such material: (*a*) inability to generate specific anti-Rh antibodies when injected in vivo by itself; (*b*) specific neutralization of anti-Rh antibodies in vitro; (*c*) specific neutralization of anti-Rh antibodies in vivo, i. e., desensitization; (*d*) clinical value in preventing development of erythroblastosis in pregnant women, and (*e*) clinical value in treatment of erythroblastotic children. Any substance with the aforementioned characteristics may be called a hapten in accordance with Landsteiner's definition[3] for substances incapable of generating specific antibodies in vivo but capable of neutralizing specific antibodies in vitro. A potent Rh hapten might have value clinically if it could "desensitize" pregnant sensitized women who would otherwise have erythroblastotic babies and thus permit the birth of normal Rh-positive children. Furthermore, such a substance could be used in newborn erythroblastotic babies and would theoretically arrest the hemolytic process. The obvious importance of these claims by Carter justifies efforts to confirm them; hence, we undertook the present clinical study of the prevention of erythroblastosis with Rh hapten.

5. Franks, M.; Berris, R. F.; Kaplan, N. O., and Myers, G. B.: Metabolic Studies in Diabetic Acidosis, Arch. Int. Med. **80**: 739 (Dec.) 1947.

6. Holler, J. W.: Potassium Deficiency Occurring During Treatment of Diabetic Acidosis, J. A. M. A. **131**: 1186 (Aug. 10) 1946.

7. Lee, J.; Naidoo, D., and Torrens, J. A.: Brit. M. J. **1**:565 (April 2) 1949.

From the Michael Reese Research Foundation.

1. Belkin, R. B., and Wiener, A. S.: Demonstration of the Properties A, B, M, N and Rh in Red-Cell Stromata, Proc. Soc. Exper. Biol. & Med. **56**:214 (June) 1944. Calvin, M.; Evans, R. S.; Behrendt, V., and Calvin, G.: Rh Antigen and Hapten: Nature of Antigen and Its Isolation from Erythrocyte Stroma, ibid. **61**: 416 (April) 1946.

2. Carter, B. B.: Preliminary Report on a Substance Which Inhibits Anti-Rh Serum, Am. J. Clin. Path. **17**: 646 (Aug.) 1947. Loughrey, J., and Carter, B. B.: Report of a Case of Erythroblastosis Fetalis Treated with Rh Hapten, Am. J. Obst. & Gynec. **55**: 1051 (June) 1948. Carter, B. B.: Rh Hapten: Its Preparation, Assay and Nature, J. Immunol. **61**: 79 (Jan.) 1949.

3. Landsteiner, K.: The Specificity of Serological Reactions, ed. 2, Cambridge, Mass., Harvard University Press, 1945.

MATERIAL AND METHODS

Rh hapten was prepared by methods as similar as possible to those of Carter. The source of the hapten was red blood cells salvaged from plasma preparation and not more than forty-eight hours old. The cells were identified by routine test as Rh positive or Rh negative and separated accordingly. The standard (O, A, B and AB) blood groupings of these cells were not considered. Twenty-two lots of Rh-positive cells were extracted and also two lots of Rh-negative cells, the latter for in vitro control tests. Each extraction yielded a yellow to yellow-brown waxy material in the amount of approximately 1 Gm. per liter of cells. The extracts from Rh-negative cells were indistinguishable in gross appearance and yield from those of Rh-positive cells. The extracts at first were dissolved in alcohol to contain 200 mg. per cubic centimeter. Alcoholic hapten was injected into the subjects after it had been warmed and admixed with 10 volumes of 0.9 per cent sodium chloride solution. All injections were given intramuscularly. Subsequently, because many patients complained of local discomfort from the alcoholic material, several batches of hapten were prepared in neutralized sesame oil (200 mg. per cubic centimeter) which could be injected without dilution, with little discomfort to the patient and with no apparent difference in activity.

Efforts were made to assay each batch of hapten by the agglutinin inhibition method described by Carter, but these efforts were unsuccessful; every lot of hapten showed apparent inhibition in high dilution, but no higher than that found in parallel tests with extracts

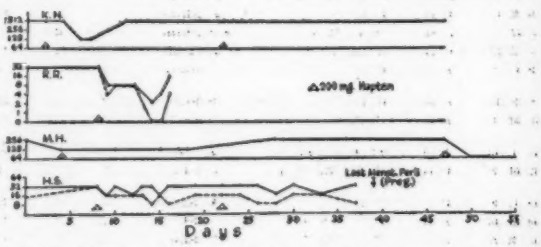

Fig. 1.—Influence of hapten injections on anti-Rh titers (at left) of sensitized nonpregnant women. The unbroken line denotes the blocking antibody titer (slide method); the interrupted line, the saline antibody titer.

from Rh-negative cells. Wiener[4] has been unable to assay Rh hapten by either inhibition tests or complement fixation tests. It was decided to attempt to assay the material by its in vivo action when injected into women sensitized against the Rh antigen.

The testing methods referred to subsequently are all standard methods. All the women who participated in this study were Rh negative as shown by negative reaction with standard anti-Rh$_0$ serum and were furthermore of subtype rh as shown by negative reactions with anti-rh′ (anti-C) serum and anti-rh″ (anti-E) serum. Husbands were classified similarly with additional tests for hr′ (c), if found to be of subtype Rh$_0$. Titers were established by the methods outlined by the National Institutes of Health,[5] to wit, the saline tube test technic, the albumin (20 per cent protein) tube test technic and the slide (20 per cent protein) technic; the first of these methods was for saline antibodies and the last two for blocking antibodies. The dilution series for titrations in this study was 1:1, 1:2, 1:4 and so forth. In the experience of this laboratory, single titrations are considered to have an experimental error of perhaps one dilution. Children born alive during this study were tested by the standard methods; tests were repeated (if the child lived) at age 2 months. Experience showed the following deviations in hapten-treated women: (*a*) the albumin tube test for blocking antibodies showed a surprisingly high

4. Wiener, A. S.: Rh Sensitization by Transfusion, J. A. M. A. **141**: 1330 (Dec. 31) 1949.

5. Minimum Requirements: Anti-Rh Typing Serums, ed. 2, National Institutes of Health, Bethesda, Md., Federal Security Agency, 1949.

incidence of prozone phenomena which could easily lead to a false assumption of antibody reduction or desensitization; (*b*) the slide test for blocking antibodies was quite dependable, and (*c*) the cells of Rh-positive children born to hapten-treated women were less reactive than usual; cells of the newborn child under these conditions seldom gave a positive reaction with the standard anti-Rh_0 (anti-D) slide serums commercially available (slide titer 64) and gave very weak to no reaction with slide serum ten to thirty times the potency of ordinary serums; the coating reactions described by Witebsky and associates[6] seldom could be elicited; the test with anti-human (Coombs-Race) serum was strongly positive; at age 2 months the normal Rh-positive reaction was present.

RESULTS

Two male Rh-positive volunteers received intramuscular injections of 200 mg. of alcoholic hapten; ill effects were not observed apart from local pain. One of the two received a second injection of 200 mg. three weeks later; again no evidence of ill effects was observed apart from local discomfort, which began at perhaps two hours after injection and persisted twenty-four to forty-eight hours.

Four nonpregnant female volunteers sensitized against Rh from previous pregnancies were given injections of Rh hapten. The effects on titers are shown in figure 1. It is to be noted that in no instance did the titer increase as would be expected if the material were antigenic.[7] In 6 of 7 instances the titer dropped, more definitely in tests for saline antibodies but also in tests for blocking antibodies. The drop was not great, perhaps two dilutions, and might be considered questionable,[8] but it was so consistent as to suggest that it was a real drop and not an error of determination. Effective desensitization could not be obtained.

Twenty-two pregnant women known to be sensitized against the Rh factor have been treated with Rh hapten. H. S. (case 1) had been treated before conception (fig. 1). The pertinent data for the pregnancies are shown in the accompanying table. The "chronologic past history" shows in order all abortions, pregnancies and transfusions of known Rh-positive blood or of blood of unknown Rh characteristics. Since many of these pregnancies occurred before the Rh problem with its intricacies was generally understood, or before modern Rh studies were clinically available, the stated past diagnoses are usually presumptive. The 22 women had collectively delivered 59 babies, 29 of whom were stillborn or died shortly after birth. R. G. (case 17) with a history of 1 normal child and L. M. (case 11) with a history of 1 normal child, 2 abortions and 1 transfusion but no definitely diseased children may be considered to have more favorable histories than the rest. F. M. (case 19) had never been pregnant previously but had received three transfusions, which apparently induced a high degree of sensitization. M. M. (case 14) had had erythroblastotic children who recovered, but had lost none. E. B. (case 2) had had a dead child, then a normal child and then an erythroblastotic infant who recovered; it is questionable whether the death reported in the first pregnancy was due to erythroblastosis. Thus, 4 of these 5 patients may be con-

Effect of Rh Hapten Injection in Twenty-Two Pregnancies

	Mother			Rh Hapten Therapy						Maternal Anti-Rh Titers		Baby		
				Total			Effective‡				During	Born†		
Case	Group and Rh	Chronologic* Past History	Father, Group and Rh	Began† at Week	No. of Injections	Total Mg.	No. of Injections	Total Mg.	Average Mg./Wk.	Pre-therapy	Therapy	at Week	Condition*	Remarks§
1	H. S.	A rh	A12, A12, ED, ERA	O Rh_1hr'—	4	17	3,200	10	2,000	80	32	16 to 32	29	D	EIUD24; hapten before conception
2	E. B.	O rh	D, T1, N, ER	B Rh_1hr'+	9	30	9,800	30	9,800	360	16 to 32	8	36	ER	
3	S. D.	O rh	N, D, D	A Rh_1hr'—	9	18	5,000	15	3,800	165	32	2 to 256	32	D	EIUD32½
4	A. H.	A rh	N, T1, ER, ED, D	A Rh_1Rh_2	9	40	12,800	40	12,800	430	32	64 to 256	39	ER	
5	E. C.	O rh	D, D	A Rh_1hr'—	14	9	2,800	9	2,800	255	128	64 to 128	28	D	EIUD28
6	G. L.	A rh	T9, N, T2, D	AB Rh_1hr'+	14	18	7,000	15	5,700	485	64	16 to 128	34	D	EIUD26
7	E. M.	O rh	N, ER, D, D	A Rh_1hr'+	15	12	3,600	12	3,600	225	128	16 to 128	32	D	EIUD31
8	C. J.	A rh	N, ED	A Rh_1hr'—	19	12	3,000	12	3,000	250	128	64	28	D, D (twins)	EIUD27½
9	E. U.	A rh	N, D, D, D	B Rh_1hr'+	19	11	3,000	11	3,000	500	256	128	30	D	EIUD25
10	M. T.	A rh	N, ED	O Rh_1hr'—	19	16	4,000	13	3,600	215	128	32 to 128	33	D	EIUD32; mother toxic
11	L. M.	B rh	A8, N, T1, A8	A Rh_1Rh_2	19	24	8,400	24	8,400	400	8	2 to 4	40	N	Baby Rh-positive
12	M. F.	O rh	N, ER, ER, D, D	O Rh_1hr'—	21	14	2,800	14	2,800	235	32	16	33	ED	Section; mother toxic
13	C. K.	O rh	N, D, N	O Rh_1hr'+	21	13	3,800	13	3,800	315	8	4 to 16	33	N	Baby Rh-negative
14	M. M.	A rh	N, T2, ER, A8	A Rh_1Rh_2	22	16	5,800	16	5,800	485	128	16 to 64	36	D	EIUD34
15	E. A.	A rh	N, T1, ER, D	B Rh_1hr'—	27	7	2,400	3	1,200	1,200	64 to 128	64 to 256	33	D	EIUD28
16	M. S.	O rh	N, D	O Rh_1hr'+	29	9	2,600	9	2,600	290	256	64	38	N	Baby Rh-negative; section
17	R. G.	A rh	N	O Rh_1hr'—	32	9	2,000	9	2,000	400	16	1 to 16	37	ERA	Section
18	R. B.	O rh	N, D, D	A Rh_1Rh_2	33	6	1,200	6	1,200	240	64	16 to 64	38	ER	Section
19	F. M.	A rh	T3	A Rh_1hr'—	34	2	1,800	1	1,600	1,600	512	128 to 256	35	D	EIUD34
20	H. B.	A rh	N, ED, A, ED	O Rh_1hr'+	35	1	200	1	200	200	32	32	36	ED	Induced
21	B. F.	A rh	D, ED, D	O Rh_1hr'+	36	3	800	3	800	400	8	64	38	ED	
22	M. K.	O rh	N, N, ED, ER, ED, A8	O Rh_1hr'+	37	7	1,400	7	1,400	700	128	32 to 128	39	ED	Induced

* A12 denotes abortion at twelve weeks after last menstrual period; ED, infant erythroblastotic and died; ERA, infant erythroblastotic and recovered but has athetosis; D, erythroblastotic stillbirth; T1, transfusion 1 pint (500 cc.) definitely or possibly Rh-positive blood; N, child normal, and ER, erythroblastotic but recovered. Diagnosis in past pregnancies frequently only presumptive.

† Calculated from last menstrual period.

‡ i. e., administered during intrauterine life.

§ EIUD32 indicates estimated intrauterine death at 32 weeks from last menstrual period.

6. Witebsky, E.; Rubin, M. I.; Engasser, L. M., and Blum, L.: Studies in Erythroblastosis Fetalis: II. Investigations on the Detection of Sensitization of the Red Blood Cells of Newborn Infants with Erythroblastosis Fetalis, J. Lab. & Clin. Med. **32**: 1339 (Nov.) 1947.

7. Hill, J. M.; Haberman, S., and Velez Orozco, A.: Preparation of Potent Anti-Rh Typing Serums by Injection of Rh Positive Blood into Previously Isoimmunized Individuals, J. A. M. A. **128**: 994 (July 28) 1945.

8. Marsters, R. W.: A Survey of the Accuracy of Rh Antibody Titrations in Several Hospital Laboratories, Am. J. Clin. Path. **19**: 1032 (Nov.) 1949.

sidered to have a more favorable history than the other 17.

The blood group and Rh characteristics of the father are likewise shown. Husbands of 3 patients, G. L., C. K. and M. S. (cases 6, 13 and 16), are definitely Rh heterozygous as shown by the birth of Rh-negative children either in the past or in the pregnancies under study. Six other husbands of subtype Rh_1hr' positive are probably heterozygous. It is known that in families with erythroblastotic children the frequency of Rh-negative infants is low.

The table shows the cases arranged according to the duration of pregnancy when hapten therapy was started. In patient H. S. (case 1) injections were started at four weeks, and at the other extreme 4 patients began hapten therapy so late as to receive injections less than four weeks before delivery.

The total number of injections and the total amount of hapten given during the pregnancy is indicated.

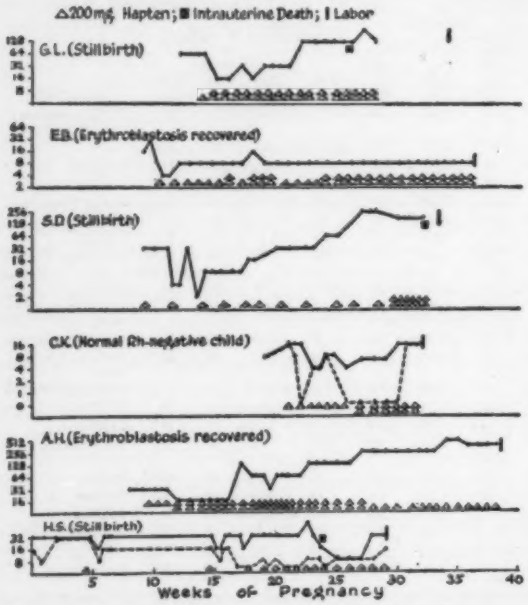

Fig. 2.—Influence of hapten injections on pregnancy in sensitized women G. L., E. B., S. D., C. K., A. H. and H. S. (cases 6, 2, 3, 13, 4 and 1, respectively, on the table). Titers are shown at left.

Obviously, women carrying children to full term would receive more treatment than those who were delivered sooner. Dosage at a given injection was at least 200 mg. but frequently more. Since injections given after intrauterine death could not be considered effective therapy, additional data are presented to show the number of "effective" injections, total amount given and average dosage per week during the period when the child was thought clinically to be alive in utero. Average dosage per week varied from a low of 80 mg. for H. S. (case 1) to a high of 1,600 mg. for F. M. (case 19), who was treated quite late, at a time when she was obviously highly sensitized and when the child in utero, as judged by subsequent events, was near death.

Maternal anti-Rh titers before therapy and during therapy are noted. The pretherapy levels show extreme variation from 8 to 512. L. M. (case 11) was kept under observation for two months before treatment was started. During this time, in view of her relatively favorable history, and of anti-Rh titers of 1 or 2, it seemed doubtful that she was sensitized. However, when the titer rose to 8 it was decided to begin therapy. In this sense treatment may perhaps be considered early. After the patient received one or two injections the titer usually dropped to the lowest levels recorded for that particular pregnancy and then rose to approximately pretherapy levels. Pretherapy levels were exceeded by more than one dilution only in S. D. and A. H. (cases 3 and 4). B. F. (case 21) was treated relatively late.

The resultant baby from each pregnancy is analyzed in terms of the week of pregnancy at which birth occurred and the condition of the child. One patient (C. J., case 8) had twins; two women had normal Rh-negative children; 1 woman had a normal Rh-positive child; 4 had erythroblastotic infants who lived, and 15 had stillbirths or children who died. When the child was a stillbirth the obstetrician was asked to estimate the date of intrauterine death. Two mothers showed evidences of toxemia, which may or may not have been related to the condition of the child in utero. The tendency toward artificial termination of labor is manifest, as the obstetrician strove to terminate the pregnancies with living children.

A review of the data in the table shows several outstanding features. Two women delivered Rh-negative children (C. K. and M. S., cases 13 and 16); in these the effects of therapy were not noticeably different from those in the other 20 women, and we were unable to predict or suspect from a study of titers during the pregnancies that the child in utero was Rh negative. However, almost every woman treated did show a drop in titer comparable to those shown in figure 1. Only 2 of the 22 women (S. D. and A. H., cases 3 and 4) had a pronounced rise in titer after the institution of therapy. L. M. (case 11) delivered an apparently normal Rh-positive child. As previously noted, this woman had a relatively favorable history, and the evidences of sensitization were unusually slight. Four other women delivered children which were definitely erythroblastotic but recovered. Two of these women, R. G. (case 17) and E. B. (case 2), were in the group with relatively favorable histories. The other 2 (A. H. and R. B., cases 4 and 18) might be considered to have good results, although it is to be noted that A. H. had persistently increasing titers in spite of intensive hapten therapy. The correlation of effective average dosage with favorable end result is of interest. If the women with Rh-negative children are excluded, together with women receiving less than four weeks of therapy, the data show 2 women receiving up to 200 mg. per week, with 2 fetal deaths; in the range of 200 to 300 mg. per week, 1 baby of 9 lived; in the range of 300 mg. per week and up, 4 of 6 infants lived. However, relatively favorable histories in 3 of the 5 women with good results and the failure to inhibit titer increase in a fourth woman (A. H., case 4) make this correlation of highly questionable significance.

Figure 2 illustrates graphically the course of titers and therapy in selected cases. C. K. (case 13), who received relatively generous hapten therapy and delivered an Rh-negative baby, is not noticeably different from the others as regards titers.

COMMENT

A number of our observations suggest that the term Rh hapten may correctly be applied to the extract described by Carter. The material does not induce an

anamnestic reaction, i. e., stimulate antibody formation and increase anti-Rh titer. The absence of toxic effects has permitted clinical trial. Clearly, the hapten does meet the first requirement of the Landsteiner definition in that the material is not antigenic. Our data also show an in vivo effect which may be called partial neutralization and to this extent would suggest that Landsteiner's second requirement of specific neutralization is met. The rather consistent small drops in titer, particularly in view of the expected tendency toward increased titers in the women who were pregnant, the tendency to induce deceptive prozone phenomena, the changes in the reactivity of the erythrocytes of babies newly born to hapten-treated women, all point to a concept of possible neutralization.

However, even if the effects observed are to be accepted as evidences of neutralization, it is clear that these effects are weak. It certainly does not follow that such effects will be reflected in clinical benefits. The high death rate in our series and the slight effect of the injection on anti-Rh titers compel us to conclude that Rh hapten is without clinical value. However, we have not fully excluded the possibility, although it seems unlikely, that exceedingly large dosage (400 to 800 mg. per week) started in the first month of pregnancy may be beneficial.

We have considered the possibility that our material was not properly prepared. We may have erred in some apparently trivial but nevertheless crucial detail of the extraction. However, we have used hapten from two other presumably reliable sources and have observed 1 woman treated with hapten from a third source but have seen no differences in clinical effect.

It is usually considered, once a woman has had an erythroblastotic child, that subsequent Rh-positive siblings will show the disease in increasingly severe form. This may be called the normal pattern. The physician, on determining that a woman is Rh negative and sensitized against the Rh factor, is strongly tempted to fit the history of past pregnancies into a presumptive pattern similar to the normal; such a pattern will appear plausible. In most instances, however, there is little evidence apart from the history to support these assumptions. As Potter [9] has shown, even autopsy reports may provide uncertain evidence. Boorman, Daley and Dodd [10] reported 2 per cent stillbirths in Rh-positive mothers as against 4 per cent in Rh-negative mothers; obviously some, perhaps one half, of the 4 per cent were not due to erythroblastosis. Race [11] studied 50 families referred as instances of Rh disease. In 7 the women were Rh positive, and of the remaining 43, 9 (21 per cent) showed instances of later siblings faring better than earlier, i. e., a reversal of the normal pattern. Similarly, in reviewing the obstetric histories of 104 Rh-negative sensitized women, we have found that 24 or 25 per cent showed a similar reversal of pattern. Indeed, a review of the 22 histories in the accompanying table shows 3 instances (H. S., E. B. and M. K., cases 1, 2 and 22) of reversal. C. K. (case 13) is not included because her third pregnancy resulted in an Rh-negative child. It is not clear whether such deviation from the normal course is due to presumptive errors based on history alone, whether it reflects in some instances more effective treatment of the newborn infant in later pregnancies or whether it is due to inherent variation in the pregnancy-erythroblastosis complex. It may therefore be expected that an occasional pregnancy will carry with it an unexpectedly favorable prognosis.

We have attempted to treat women who in the absence of treatment could be expected to show a large proportion of fatal erythroblastoses. However, of the 22 treated, 2 (C. K. and M. S., cases 13 and 16) gave birth to normal Rh-negative children and are of value only as controls. The hapten did not show distinctive effects on the titers of these 2 women, although they were spared antigenic stimulation from the fetus and received generous doses of the hapten. Two other women, L. M. and R. G. (cases 11 and 17), had relatively favorable histories and had not actually delivered erythroblastotic children previously. The results in R. G., who had a single normal child and then, with hapten therapy, an erythroblastotic infant who recovered, may be considered to be within expectations for untreated women. Similarly, L. M. (case 11) had had a single normal child, but the birth of an apparently normal Rh-positive child is less easy to understand. It has been noted that this woman was kept under observation for some two months because her titers were extremely low (1 to 2), and then given hapten therapy only when the titer rose to 8 and sensitization was considered established. E. B. (case 2) probably had a better prognosis than most of the other patients; the death recorded in her first pregnancy was probably not due to erythroblastosis, since the next two siblings did better than the first. Thus, in 3 women who delivered living Rh-positive babies Rh sensitization may be considered to be milder. It is to be observed also that there were considerable variations in dosage, ranging from as low as 80 mg. per week to over 1,000 mg. during the period of estimated viability. Four of the women with good results received heavier dosage.

In addition to the 3 women (E. B., L. M. and R. G., cases 2, 11 and 17) who may be considered to have good results, A. H. (case 4) showed an unexpectedly favorable outcome. The living child may be attributed either to hapten therapy or to immediate exchange transfusion following birth in contrast to less efficient management of earlier siblings. It is of interest that the mother showed a stubbornly increasing titer during the period of hapten therapy, and that the titer rose to levels which would ordinarily be considered exceedingly grave. Patient R. B. (case 18) must also be considered to have had a good result because the child lived.

However, the remaining 15 women showed dismal results. All the children died, 12 being stillbirths. The estimated intrauterine death rate makes it more nearly certain that the hapten was of little help, because in many instances the intrauterine death occurred four weeks or more prior to delivery.

Thus, of 22 women, 2 delivered normal Rh-negative children; 15 delivered stillbirths or babies dying shortly after birth, and 5 delivered Rh-positive babies who lived. Of this last group, 3 mothers had relatively favorable histories and 4 had received relatively generous hapten therapy. It is difficult to ascribe the good results to hapten therapy and easier to attribute them to the natural variations of the disease.

The clinical value of the hapten is definitely disappointing. The evidence suggests that the material has extremely low potency. Possibly if it was used in large doses (400 to 800 mg. per week) and given early in

9. Potter, E.: Rh: Its Relation to Congenital Hemolytic Disease and to Intragroup Transfusion Reactions, Chicago, The Year Book Publishers, Inc., 1947.

10. Boorman, K. E.; Daley, D., and Dodd, B. E.: The Relation Between the Results of ABO and Rh Tests and the Clinical Condition of 2,000 Mothers and Infants, J. Obst. & Gynaec. Brit. Emp. 54: 281 (June) 1947.

11. Race, R. R.; Taylor, G. L.; Cappell, D. F., and McFarlane, M. N.: The Rh Factor and Erythroblastosis, Brit. M. J. 2: 289 (Sept. 4) 1943.

pregnancy more favorable results might be obtained. This, however, is a difficult problem and not at all practical. To provide 800 mg. of hapten per week would require extraction from over one hundred blood donations of 500 cc. each per pregnancy. It is clear that no woman should be encouraged to conceive with the hope that hapten will be helpful. Although we did not encounter this complication, a theoretic possibility exists that these extracts of human red blood cells might result in the transmission of hepatitis.

CONCLUSION

Rh hapten prepared according to the methods of Carter is not of clinical value in altering the fetal prognosis. An occasional good result may be anticipated because of the variability of the disease.

It is probable that the Carter extracts are hapten in character, although of exceedingly low potency.

No Rh-sensitized woman should be encouraged to conceive in the hope that hapten therapy will alter the prognosis for the child.

TUBERCULOUS MENINGITIS

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Treatment of tuberculous meningitis with streptomycin has so far achieved only a limited success. During the first nine months of 1949 in England and Wales there were 876 deaths from this disease, while in the United States results in most centers seem to have begotten the feeling that newer methods of chemotherapy must be sought. We hope to show that these conclusions are premature, first by describing our results at Oxford of treatment with streptomycin alone and second by referring briefly to the effects of supplementing this treatment with intrathecal injections of tuberculin.

METHODS OF TREATMENT AND RESULTS

Since November 1946 we have treated 93 patients with tuberculous meningitis (table 1), in all but 1 instance bacteriologically verified. As soon as sufficient streptomycin was available the patients were

TABLE 1.—*Condition on June 1, 1950 of 93 Patients Treated for Tuberculous Meningitis Between November 1946 and May 1950*

Treatment Begun	Alive	Dead
November 1946 to June 1947 (42 to 35 mo. ago)	5	6
July 1947 to December 1947 (35 to 29 mo. ago)	5	4
January 1948 to June 1948 (29 to 23 mo. ago)	7	8
July 1948 to December 1948 (23 to 17 mo. ago)	6	8
January 1949 to June 1949 (17 to 11 mo. ago)	13	7
July 1949 to December 1949 (11 to 5 mo. ago)	11	4
January 1950 to May 1950 (within last 5 mo.)	5	4
	52	41

completely unselected; the majority were confused, stuporous or even comatose when treatment was begun. In the first 60 of these patients who began treatment over 1 year ago the recovery rate is 50 per cent. The majority of the deaths occurred in the first three months; the relapse rate after a full course of treatment was low, 4 in 60 (fig. 1).

From the Radcliffe Infirmary, Oxford, and Military Hospital, Wheatley, England.

These results were obtained by treating each patient with streptomycin intrathecally daily for the first six to twelve weeks or even longer (for adults 100 mg., for infants and children 50 to 75 mg. daily) and with streptomycin intramuscularly daily without rest periods for not less than six months (for adults 2 Gm. daily, for infants and children 20 mg. per pound of body weight daily). This was followed by rest and graduated exercise, usually at a sanatorium, for a further three to six months. The full details of treatment have been described elsewhere.[1]

TABLE 2.—*Meningitis with Overt Miliary Tuberculosis or Chronic Phthisis*

Duration of Treatment	Treatment Begun	Miliary		Chronic Phthisis	
		Alive	Dead	Alive	Dead
6 mo.	Nov. 1946 to Sept. 1948	2	6	1	0
12 mo.	Oct. 1948 to Oct. 1949	5	2	2	1

Our results have been virtually the same in all age groups, except the two extremes. Young adults, and these include many soldiers, have done almost as well as children. Thus, we do not confirm the data of the Streptomycin Committee of the Veterans Administration,[2] whose survival rate for "pure" meningitis was "about 15 per cent," and for meningitis with miliary tuberculosis nil. As judged by psychometric tests, and by performance at work or school for as long as two and one-half years, the quality of intellectual recovery has been in all cases highly satisfactory. This is remarkable, considering the prolonged retrograde and anterograde amnesia, the distribution of the exudate around the brain stem and the consequent risk of infarction of the central gray matter. However, in the infants and young children, as Crothers and his co-workers [3] have pointed out, the quality of the result can only be accurately assessed by systematic observation of intellectual development over a period of years. The physical disabilities in the 30 survivors are total deafness in 2, fits in 1 who had epilepsy before she contracted meningitis, slight weakness of one hand as the remains of a hemiparesis in 2, somatic tuberculosis requiring treatment in 4 cases (pulmonary 3 and spinal 1).

With the foregoing regimen our results in cases in which meningitis was associated with miliary tuberculosis or pulmonary tuberculosis of adult type were bad. Accordingly, toward the end of 1948 we decided to treat these patients with streptomycin intramuscularly daily for twelve months and with three or four courses of streptomycin intrathecally during the same period (fig. 2). The results to date have justified this prolonged treatment (table 2).

Thus, we have administered streptomycin for a much longer time than most other workers in this field, and the behavior of the disease under treatment has justified our policy. Indications of active disease, such as third nerve palsy and hemiplegia, have appeared up to seventeen weeks after the onset of treatment. In patients who subsequently recovered Mycobacterium tuberculosis has been grown from the cerebrospinal fluid in the eleventh week of treatment and has been seen in films of the cerebrospinal fluid in the seventeenth week

1. (a) Smith, H. V.; Vollum, R. L., and Cairns, H.: Treatment of Tuberculous Meningitis with Streptomycin, Lancet **1**: 627, 1948. (b) Cairns, H., and Taylor, M.: A Review of the Treatment of Tuberculous Meningitis with Streptomycin, Proc. Roy. Soc. Med. **42**: 155, 1949.

2. Streptomycin Committee of the Veterans Administration: Current Status of the Chemotherapy of Tuberculosis in Man, Report to the Council on Pharmacy and Chemistry, J. A. M. A. **142**: 650 (March 4) 1950.

3. Crothers, B.; Lord, E., and McGinnis, M.: Prognosis After Encephalopathy in Infancy, J. Mt. Sinai Hosp. **9**: 376, 1942.

of treatment. As in tuberculosis of other parts of the body, in the meninges the inflammation is exceedingly slow to subside, even in the most favorable case: although at the end of six months of streptomycin therapy the cells and protein of the cerebrospinal fluid are usually approaching normal, it may be a further six months. It is indeed difficult to lay down precise rules about stopping treatment. We have ample evidence that treatment can be stopped too soon but none that it can be continued too long. After streptomycin therapy is stopped the importance to the patient of rest and of the most carefully graduated exercise should be kept in mind, no less for meningitis than for other forms of tuberculosis.

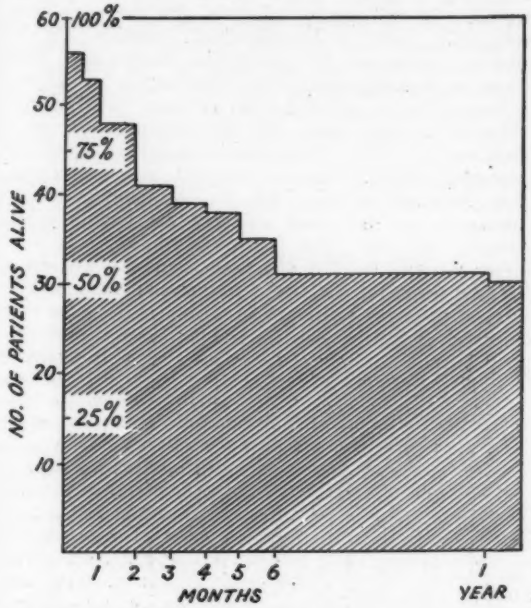

Fig. 1.—Survival rate in April 1950 of 60 patients with tuberculous meningitis who began treatment with streptomycin over one year previously. Twenty of these had miliary tuberculosis as well, but this was recognized in life in only 15.

to twelve months before they are finally within normal limits,[4] the protein usually being the last to fall. Further justification of our policy is afforded by the failure of systematic attempts of others [5] to reduce the length of treatment.

With increasing experience our tendency has been to prolong treatment beyond the prescribed time. Routine discontinuance of streptomycin after an arbitrary period of weeks or months may be disastrous, and each case should be carefully reviewed before treatment is stopped. Intrathecal injections daily should be continued for at least eight weeks after the last positive films or cultures [6]; and until cerebrospinal fluid studies show that the cell fluctuations have disappeared and the level of protein is stationary or falling; until there is no clinical evidence of active disease, and in particular until the weight has ceased to fall. Persistent wasting and poor health are an indication for continuing with intrathecal administration of steptomycin rather than for stopping it. Streptomycin intramuscularly should be continued for at least one hundred and eighty days, no matter how well the patient may meanwhile have become. It should not be stopped until the patient is gaining weight and the protein and cells in his cerebrospinal fluid have been steadily falling for at least two

4. We regard as normal 5 white cells or less per cubic millimeter and 35 mg. of protein or less per hundred cubic centimeters.

5. Dubois, R.; Linz, R.; Delcourt, R., and van Wien, H.: Observations recueillies au cours d'un essai de traitement de la méningite tuberculeuse par la streptomycine, Acta pædiat. belg. 3: 5, 1949. MacCarthy, D., and Mann, T. P.: Tuberculous Meningitis in Children: Rhythm of Treatment, Prognosis and Results, Lancet 1: 341, 1950.

6. Every sample of cerebrospinal fluid is cultured.

TOXICITY OF STREPTOMYCIN

Details of the impairment of hearing and of vestibular function have been given elsewhere.[1b] Five of our first 60 patients became totally deaf, all but 1 in the third and fourth months of treatment. Total deafness should not be regarded as a contraindication for continuing streptomycin, except in children who have not yet learned to talk. In 1 case intrathecal injection of streptomycin was followed by brief coma on two occasions, without evidence of chemical meningitis. In patients with associated renal tuberculosis and a rising blood urea level the systemic dosage of streptomycin must be adjusted so that the blood level of streptomycin does not exceed 20 micrograms per cubic centimeter.

After intrathecal injections nystagmus, vertigo, nausea and vomiting are common. In infants, in whom the vomiting may seriously increase the dehydration, fluids may need to be given parenterally. In some patients the vomiting is lessened by administration of diphenhydramine (benadryl®) hydrochloride, in others by changing from streptomycin to dihydrostreptomycin, or vice versa; in virtually all it stops when the meningitis comes under control, even though streptomycin is still being given. Vomiting is not then brought on again by further intrathecal courses of the drug. With the daily intrathecal injections in the first months of treatment there is often a meningeal reaction (increase of fever, of head retraction, of spinal rigidity and of white cells in the cerebrospinal fluid); this reaction should not be regarded as a toxic symptom but as the expression of a process which is essential to recovery.

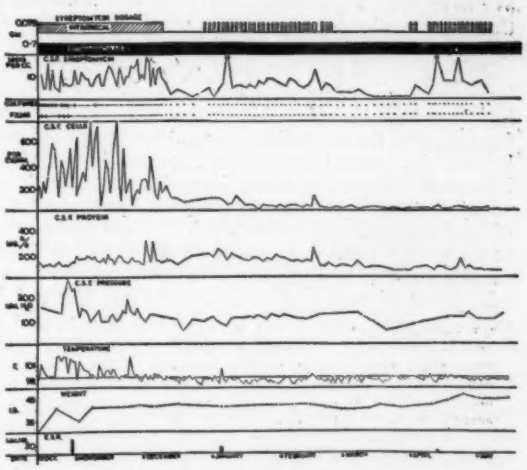

Fig. 2.—E.S., a child aged 6 years, had tuberculous meningitis with miliary tuberculosis. Treatment began in October 1948, with continuous intramuscular injection of streptomycin for one year, of which only the first eight months are graphed. The child received three courses of streptomycin intrathecally, daily in the first course and every second day for subsequent courses. Cultures of the cerebrospinal fluid were positive for the first month, thereafter negative, with typical fluctuations of white cells during the first six weeks but not during subsequent courses. There was less rise in the cerebrospinal protein than usual. An initial rise of intracranial pressure was observed. The temperature was above normal for the first seven weeks. In spite of excellent clinical condition the weight of the child was stationary until the sixth month, when the third intrathecal course was begun. The child made a complete recovery.

BACTERIAL SENSITIVITY

Serious resistance of organisms in the cerebrospinal fluid to streptomycin was encountered in 6 of our first 80 patients. In 1 of the 6, with a leaking tuberculous abscess of the parietal lobe giving rise to meningitis, the minimum inhibiting concentration of streptomycin in the first cultures was 500 micrograms per cubic centimeter. Sensitivity tests on successive cultures were performed in 40 patients, the resistance on each occasion being compared to that of a standard culture (H 37 R V). In 4 patients the resistance increased eightyfold to one hundredfold in two and one-half, three, six and nine months, respectively; in another the resistance increased sixteenfold in four and one-half months. All these patients died. Slight increase of resistance, up to eight times the initial resistance, was encountered in 5 other patients; in these the lowest inhibiting concentration did not exceed 2 micrograms per cubic centimeter. Three of these 5 patients survived.

Thus, in the majority of the cases, including those with cultures at intervals of four to ten months, no drug-fast strains were encountered.

NEED FOR NEUROSURGICAL FACILITIES

All our patients were treated in centers which have facilities for minor neurosurgical operations. In spite of great care with the daily lumbar punctures the spinal subarachnoid space became partly or completely blocked at some stage of the illness in about one third of the cases. Bifrontal burr holes were immediately made, if not already present, and the streptomycin was injected into the ventricles, or occasionally into the cisterna magna, until the lumbar subarachnoid space opened again. There should never be a day during treatment when one does not have free access to the cerebrospinal pathways, either for giving streptomycin or for withdrawing cerebrospinal fluid to relieve rise of intracranial pressure. There is much to be said for making frontal burr holes in all cases at the outset of treatment. We have never regretted making them and have sometimes needed them in a hurry. Ventricular studies are useful for diagnosis as well as for treatment.[7]

As our experience increased it seemed that major intracranial operations to relieve established or increasing hydrocephalus were seldom required, but the need for access to the ventricles through burr holes did not lessen. In several patients we placed polyethylene tubes in the cisternae chiasmatica and interpeduncularis, where the exudate is usually maximal, for the purpose of local application of streptomycin.[7a] We had intended to apply this method in infants under 3 years of age in whom at that time the mortality with ordinary methods of administration of streptomycin was reported to be 82 per cent[8]; but we found that our own results in infants treated by ordinary methods were considerably better than this figure, and it seemed wiser, therefore, to concentrate on establishing a base line for prolonged treatment by ordinary methods. Hence, although it proved practicable even in infants, we abandoned the method for the time being.

PROBLEMS OF DIAGNOSIS

A good bacteriologist will find Myco. tuberculosis in films of the cerebrospinal fluid in over 90 per cent of cases of tuberculous meningitis, though sometimes he may have to search for hours. There remains a small group in which there is strong suspicion but no proof of tuberculous meningitis. These are cases in which there is slight or moderate pleocytosis in the cerebrospinal fluid and in which clinical examination and ventriculography, or ventricular estimation, have excluded pyogenic brain abscess and intracranial tumor. In this group of cases the diagnosis may ultimately prove to be spirochetal jaundice (Weil's disease), infectious mononucleosis, mumps and other forms of meningoencephalitis, lymphocytic meningitis, poliomyelitis of aberrant form or—and most often—tuberculous meningitis. In this group streptomycin treatment as for tuberculous meningitis should be started promptly. The next few days may give a positive Mantoux reaction (to 1:100 dilution of old tuberculin or less) and evidence of somatic tuberculosis, or may give positive evidence of some other disease; but the diagnosis is most often settled by the behavior of the cerebrospinal fluid in the patient receiving streptomycin treatment. In the nontuberculous patients the cells and protein of the cerebrospinal fluid usually fall even while streptomycin intrathecally is being continued, and at the same time there is pronounced clinical improvement. In most instances of tuberculous meningitis there is, within a few days of the first intrathecal injection of streptomycin, a rise of cells and protein in the cerebrospinal fluid with considerable fluctuations (fig. 2). The resultant spikes of cells and protein appear to be specific for tuberculous meningitis, but they are not invariable in that disease; hence, in a small proportion of the undiagnosed cases the decision whether or not to continue streptomycin treatment until the cultures of cerebrospinal fluid can be read may remain for some weeks extremely difficult. There is a small group of cases of tuberculous meningitis in which after a sharp onset the symptoms may remit or may remain deceptively mild for weeks or months, especially if patients are treated for a few weeks with streptomycin, only later to declare themselves in what has inconspicuously become an irremediable state. We have done harm by stopping streptomycin therapy prematurely in patients who ultimately were proved to have tuberculous meningitis; but we have not done harm by continuing intramuscular and intrathecal injection of streptomycin for as long as a month in patients who ultimately proved to have some other disease; nor has the clinical or cerebrospinal fluid picture in such cases been so distorted by streptomycin that treatment must be continued indefinitely for want of differential diagnosis.

In cases of miliary tuberculosis lumbar punctures should be performed every week because under systemic streptomycin treatment the evolution of meningitis in such cases may for weeks be almost asymptomatic. In a few cases the meningitis may be of the serous variety,[9] but a few weeks of treatment with streptomycin intrathecally will not harm these patients.

TUBERCULOUS LESIONS ELSEWHERE

Some patients may die of tuberculous lesions in other parts of the body while their meningitis is responding favorably. In others it seems that recovery from meningitis is not maintained because of a persistently active lesion elsewhere. For example, in 1 patient the meningitis took an unfavorable turn in the third month of

7. (a) Cairns, H.: Surgical Aspects of Meningitis, Brit. M. J. 1:969, 1949. Smith, Vollum and Cairns.[7a] (b) Cairns and Taylor.[7b]

8. Streptomycin in Tuberculosis Trials Committee, Medical Research Council: Streptomycin Treatment of Tuberculous Meningitis, Lancet 1:582, 1948.

9. Lincoln, E. M.: Tuberculous Meningitis in Children, With Special Reference to Serous Meningitis, Am. Rev. Tuberc. 56:95, 1947.

treatment. At necropsy there was a large liquid abscess of a mesenteric gland which was swarming with Myco. tuberculosis, and there were active tuberculous ulcers in the bowel; the whole of this infected area could have been surgically removed. In 3 cases of our series when the meningitis was under control a tuberculous lesion elsewhere was removed: in 2 cases a mass of tuberculous glands in the neck, in another a lung. We think that this type of treatment should be undertaken whenever possible, but we admit that the determination of just what somatic tuberculous lesions are present and of their accessibility to radical surgical intervention may be extremely difficult. Operation should be undertaken if possible while the systemic organisms are still sensitive to streptomycin. In these cases also streptomycin therapy should be supplemented with paraaminosalicylic acid.

THE HITHERTO INTRACTABLE CASES

When we reexamine our own results in the 60 cases which are more than a year old, we find that in addition to the 30 patients who have recovered there are another 6, perhaps 8, who might have survived had we been more acute in diagnosis, more persistent with streptomycin treatment or more insistent on prolonged hospital care. After allowance for such cases there are still 40 per cent of patients in whom streptomycin completely failed to effect a cure. These patients mostly died within the first four months while receiving intensive chemotherapy. It could not usually be predicted at the onset of treatment which patients would take this course. They became drowsy, then went into profound coma, and usually decerebrate rigidity developed; at necropsy they had intense exudate in the cisternae ambiens (venae magnae cerebri), interpeduncularis and chiasmatica, and in the sylvian fissures. Often there was also tuberculous arteritis of perforating vessels with infarctions in the basal ganglions.[10] Within the solid exudate there were fibrocaseous areas in which Dr. Dawn Bosanquet frequently found acid-fast bacilli. In this group of seemingly intractable cases we have recently had some encouragement from the use of tuberculin intrathecally in combination with streptomycin.

THE MENINGEAL REACTION

Charts of the daily cerebrospinal fluid observations, which are made in every case, show that during the first weeks of streptomycin treatment there are usually frequent bursts of pleocytosis with white cell counts above the range seen in the untreated disease (fig. 2). Typically these high spikes of cells contain from 60 to 80 per cent polymorphonuclear leukocytes. They are not due to subarachnoid bleeding from lumbar puncture or to pyogenic infection; nor are they due to irritation by intrathecally given streptomycin, since they disappear before intrathecal injections are stopped and do not reappear when these are resumed (fig. 2). In the successful cases the spikes of cells gradually become smaller and eventually flatten out; if the disease recrudesces, as shown by reappearance of mycobacteria in films or cultures or by the onset of focal neurologic signs, the bursts of pleocytosis may reappear. After each burst of cells there is often a sudden rise of protein in the cerebrospinal fluid.

These spikes of cells and protein in the cerebrospinal fluid are not seen in other varieties of meningitis treated by streptomycin. They appear to be specific for tuberculous meningitis. Dr. Honor Smith suggested that they might be caused by the liberation of bacterial breakdown products, i. e., of tuberculin, into the cerebrospinal fluid of the sensitized patient. She showed that in subjects with normal meninges intrathecal injection of minute amounts of purified protein derivative of tuberculin produced no reaction if the Mantoux test was negative, whereas if it was positive the injection of purified protein derivative was followed by pleocytosis and rise of protein, resembling that seen in patients under treatment for tuberculous meningitis. For the first twenty-four hours the cells were mainly polymorphonuclear; after forty-eight hours they were entirely lymphocytic. The reaction was benign but lasted for many days. It could be reproduced at will.

TUBERCULIN INTRATHECALLY

In the summer of 1949 Dr. Smith injected purified protein derivative intrathecally in 3 patients in whom all hope of recovery had been abandoned.[11] The results exceeded our most sanguine expectations.

The first case was a child 2 years of age with miliary tuberculosis who was in the third month of a proved meningitis which was being treated with streptomycin. He was severely wasted, with progressive hydrocephalus and intense head retraction, and he was in coma. All four limbs were spastic and immobile and tightly flexed across his body. His pupils were dilated and fixed to light, and he appeared to be blind. He had a complete spinal block.

Injections of purified protein derivative of tuberculin were begun on June 20, 1949, first into the lateral ventricle and then into the cisterna magna. After an intense clinical reaction there was a moderate increase of cells and protein in the cerebrospinal fluid. The dosage of purified protein derivative was cautiously increased, and the successive responses became less intense.

As the weeks passed it became apparent that the child was improving. In August he began to gain weight, his head was less retracted and he began to move his limbs. It now became evident that he had a right hemiparesis. By mid-September it seemed that his sight was returning, and a few weeks later it was obvious that he was seeing well. His arms were straightening, but his legs were still flexed, stiff and painful. During November, after six months of dry taps, lumbar punctures yielded a slow flow of cerebrospinal fluid. His legs straightened. By January 1950 he could feed himself and pull himself up onto his knees. By February he could stand, and in March he walked and learned clean habits. In May, at Peppard Sanatorium where his mother was still receiving treatment for pulmonary tuberculosis, he was a fat, active, healthy-looking little boy with a head of normal size, a growing vocabulary and what appeared to be a normal intelligence. There was still a slight and diminishing residuum of right hemiparesis. Roentgenograms of his chest were clear, his cerebrospinal fluid was normal, and the spinal theca was open.

The recovery in this case was quite unexpected and from its quality almost miraculous. It was beyond anything previously obtained with streptomycin alone. The second case presented a different but equally grave problem, and in it also, after intrathecal injections of purified protein derivative, an unexpected recovery was obtained.[11] After each injection of purified protein derivative there was a temporary and sometimes alarming exacerbation of the meningeal symptoms, with rise of intracranial pressure.

10. Smith, H. V., and Daniel, P.: Some Clinical and Pathological Aspects of Tuberculosis of the Central Nervous System, Tubercle **28**: 64, 1947. Daniel, P. M.: Gross Morbid Anatomy of the Central Nervous System of Cases of Tuberculous Meningitis Treated with Streptomycin, Proc. Roy. Soc. Med. **42**: 22, 1949.

11. Smith, H. V., and Vollum, R. L.: Observations on the Effects of Intrathecal Tuberculin and Streptomycin in Tuberculous Meningitis: An Interim Report, Lancet, to be published.

The third case chosen for trial was a child aged 5½ years who after three weeks of treatment with streptomycin went into deep coma with decerebrate rigidity, a state which in our experience has always been rapidly fatal and always associated with intense exudate in the cisternae ambiens and interpeduncularis. This child proved exceedingly sensitive to purified protein derivative, with the typical clinical and cerebrospinal fluid response. As the weeks passed it became clear that each reaction was followed by slight improvement. Swallowing, coughing and crying returned, and obstructive hydrocephalus failed to develop. But recovery was incomplete: the posture of her limbs changed from extension to flexion, and the child remained comatose. She died after ventriculography on the one hundred and seventieth day of treatment. Necropsy showed that her meningitis had so largely resolved that to the naked eye the cisterna ambiens and sylvian fissures appeared empty. There was slight thickening of the basal meninges, and there was a small, firmly encapsulated, tuberculoma in the temporal lobe, which might well have acted as a "Rich's focus."[12] In addition there were several old and shrunken infarcts in the basal ganglions and external capsules, which accounted for the decerebrate state and for the failure of recovery after the meningitis resolved. In the lungs there was a well calcified primary complex, but no sign of tuberculosis was evident elsewhere.

The result in this case confirmed our previous experience that satisfactory recovery does not follow once decerebrate rigidity has been established. It also proved beyond reasonable doubt that the effect of the intrathecal injection of purified protein derivative is to dissolve the exudate. This is precisely what Robert Koch[13] claimed for his tuberculin in 1890. The difference is that his use of tuberculin was followed by severe dissemination of the disease (Virchow[14]), whereas under cover of streptomycin this complication can be prevented.

The response to intrathecally given purified protein derivative of tuberculin is much more than a chemical meningitis. It seems to be specific, since it appears only in sensitized subjects; and the preliminary experiments of Drs. Vollum and Bosanquet with intrathecal injection of purified protein derivative point to a selective response in guinea pigs. In sensitized subjects the capillaries in the meninges or in the exudate allow the transudation of white cells, and sometimes of red cells, and of proteins. In some way lysis of the exudate is produced.

Intrathecal use of tuberculin is being cautiously extended to a larger series of patients. A practicable method of using the tuberculin in carefully graded doses is being devised.

If the Mantoux test is strongly positive at the end of twenty-four hours the initial intrathecal dose is 0.0000035 mg. of purified protein derivative; injections are given every other day, with double the preceding dose, until a reaction is obtained. If the Mantoux reaction at the end of twenty-four hours is weakly positive the initial dose of purified protein derivative is 0.0000075 mg., and the dose is trebled or quadrupled every other day. Once there is a clinical or meningeal reaction to the tuberculin the dosage and its rate of increase are carefully adjusted according to the intensity of the reaction. The injections are usually given once every four days, to enable the patient to have two days free from the fever, meningism and vomiting between each reaction. They are continued until the clinical recovery of the patient is beyond question. Streptomycin is given as outlined at the beginning of this paper, and for the same period of time.[15]

It is probably unwise to embark on tuberculin injections without making frontal burr holes for ventricular taps should the reaction to injections be too intense. Tuberculin is not given subcutaneously or intramuscularly because preliminary observations indicate that the general reaction to systemic injection of tuberculin in sensitized subjects does not extend to the cerebrospinal pathways.

The results in the later series of cases is to date encouraging, but in a disease like tuberculous meningitis no results are really valid under a year from the beginning of treatment. Meanwhile it cannot be too strongly emphasized that in the presence of active meningitis intrathecal injections of purified protein derivative are potentially extremely dangerous. Without the most careful grading of dosage of the tuberculin and the closest observation and supervision of the patient a disaster might all too easily occur.

CONCLUSION

Recovery from tuberculous meningitis with the aid of chemotherapy is a slow process taking a year or even more, as might be expected from the behavior of tuberculosis of other parts of the body. Streptomycin must be given to the patient for a long period, and treatment with the drug should be followed by rest and graduated exercise on sanatorium lines.

The problem of treatment is more complicated than in most bacterial infections so far treated with antibiotics. The infection is associated with an elaborate tissue response (the granulomatous reaction), and this is something with which antibiotics unaided are not designed to deal. Something more is required than an agent which will destroy bacteria. Preliminary experiences with intrathecally injected tuberculin (purified protein derivative), which have been encouraging from the therapeutic point of view, indicate that this substance used intrathecally results in a lysis of the exudate and that in these circumstances streptomycin is a better remedy for tuberculous meningitis than has hitherto been supposed. Possibly other substances might act in the same way as tuberculin.

12. Rich, A. R., and McCordock, H. A.: The Pathogenesis of Tuberculous Meningitis, Bull. Johns Hopkins Hosp. **52**: 5, 1933.
13. Koch, R.: Weitere Mitteilungen über ein Heilmittel gegen Tuberculose, Deutsche med. Wchnschr. **16**: 1029, 1890.
14. Virchow, R.: Ueber die Wirkung des Koch'schen Mittels auf innere Organe Tuberculöser, Berl. klin. Wchnschr. **28**: 49, 1891.
15. Reduction of this streptomycin regimen, in particular of dosage, may be possible with extended use of purified protein derivative. We are not in a position to try this ourselves at present, because in human tuberculous meningitis each therapeutic trial takes at least a year, and the number of variables must be kept to the minimum.

Precedence When Several Physicians are Summoned.—When several physicians have been summoned in a case of sudden illness or of accident, the first to arrive should be considered the physician in charge. However, as soon as is practicable, or on the arrival of the acknowledged personal or family physician, the first physician should withdraw. Should the patient, his family or his responsible friend wish some one other than he who has been in charge of the case, the patient or his representative should advise the personal or family physician of his desire. When, because of sudden illness or accident, a patient is taken to a hospital without the knowledge of the physician who is known to be the personal or family physician, the patient should be returned to the care of the personal or family physician as soon as is feasible.

Arbitration.—Whenever there arises between physicians a grave difference of opinion, or of interest, which cannot be promptly adjusted, the dispute should be referred for arbitration, preferably to an official body of a component society.

From the PRINCIPLES OF MEDICAL ETHICS of the American Medical Association.

THROMBOEMBOLISM ASSOCIATED WITH AURICULAR FIBRILLATION

Continuous Anticoagulant Therapy

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About three times as many patients with rheumatic heart disease and auricular fibrillation have intracardiac thrombi as those with normal rhythm (table 1, 45.7 and 15.7 per cent). The arrhythmia, and not factors associated with age, apparently is the main factor causing the thrombus.[1] According to the available data, auricular fibrillation is responsible for extra clot formation in 25 to 30 patients of 100 with rheumatic heart disease. The prevention of this formation of antemortem clots could theoretically be accomplished by continuous anticoagulant treatment following the establishment of the arrhythmia.

The recognized hazards of dicumarol® have usually restricted its use in auricular fibrillation to those patients gravely sick with repeated embolic episodes. For such patients the drug has proved gratifying in the prevention of further thromboembolism.[2] Its use apparently prevents the propagation of already formed thrombi. The prevention of formation of primary intracardiac thrombi, too, theoretically is possible. The risk of thrombus formation, with a simultaneous increase in the risk of embolism, begins as soon as auricular fibrillation becomes established.

If dicumarol® is given continuously prior to recognizable embolism, there must be a reasonable assurance that the benefit will justify the bother and expense of control and the dangers of the drug. It is probable that safer anticoagulant drugs will be available eventually. At present, the incidence of deaths and complications from intracardiac clot formation must be balanced against the similar hazards of the use of dicumarol.® About 20 of 100 patients dying of rheumatic heart disease and auricular fibrillation die from thromboembolism.[3] The majority show systemic embolic infarction from cardiogenic thrombi. In approximately 15,500 patients treated with anticoagulants (about 90 per cent of whom received dicumarol® alone), Nichol[4] found a mortality rate attributable to anticoagulants of only 0.18 per cent. Many deaths following administration of dicumarol® occurred early in its use before certain contraindications were known. Major bleeding occurred in only 2 per cent of the patients and was usually associated with potential bleeding areas such as ulcers, varices or hemorrhoids. Other instances have been due to improper supervision. Prolonged anticoagulant therapy, however, is feasible and relatively safe.[5] Dicumarol,® like insulin, is a potent drug and must be controlled by an adequate number of tests of the blood level. The interval between determinations will vary with the response of the patient. The successful use of dicumarol® as emphasized by Foley and Wright depends on an essential triad: a vigilant physician, a cooperative patient and a readily available, reliable laboratory. If these factors are present, its continuous use is practical, practicable and effective. If not, the use of the drug is dangerous. In relation to the number of statistically anticipated complications and deaths occurring in the untreated patient, the intelligent use of dicumarol® is relatively safe. In many instances, it represents an acceptable, calculated clinical risk.

MATERIAL

We wish to report the use of continuous ambulatory dicumarol® therapy in 20 patients with heart disease and auricular fibrillation. The etiologic diagnosis was rheumatic heart disease in 10 and nonrheumatic heart disease in 10. The average age of the patients was 52 in the former group and 63 in the latter group. The periods of use have varied from two months to over two years, the period of treatment in each patient averaging nearly eleven months. In all 20 patients previous attempts either to restore or to maintain normal rhythm had been unsuccessful. In 16 the arrhythmia was the established and in 4 the paroxysmal form. In 13 embolism had occurred, in 7 of these repeatedly, prior to the use of dicumarol.® In 7, no clinically recognizable emboli had appeared, and dicumarol® was administered to prevent intracardiac clot formation.

TABLE 1.—*Incidence of Mural Cardiac Thrombi in Rheumatic Heart Disease*

	Rheumatic Heart Disease with Auricular Fibrillation			Rheumatic Heart Disease with Normal Rhythm		
	Total No.	No. with Thrombi	Percentage with Thrombi	Total No.	No. with Thrombi	Percentage with Thrombi
Graef *	42	10	24.5	77	5	6.5
Garvin †	60	26	43.3	50	9	18.0
Hay & Levine [1]						
Under 40	30	10	33.3	45	4	8.8
Over 40	76	42	55.9	35	7	20.0
Soderstrom ‡	109	57	52.2	110	25	22.0
Total	317	145	45.7	317	50	15.7

* Graef, I., and others: Arch. Path. **24**: 344, 1937.
† Garvin, C. F.: Am. Heart J. **21**: 713, 1941.
‡ Soderstrom, N.: To be published.

RESULTS

In two instances the results were spectacularly good. For each patient frequent hospitalization previously had been necessary for repeated cerebral, pulmonary, renal and mesenteric emboli. Each patient has had no recognizable emboli since treatment with anticoagulants, one for a period of twenty-three months, the other for over two years. In 4 patients with only single recognized emboli and in 2 with multiple emboli, there have been no recurrences. In the 7 who had had no recognizable emboli previously, no thromboembolism occurred during dicumarol® therapy. In 4 of the 20 patients thromboembolism occurred after dicumarol® therapy had been started. One of these 4 had a cerebral embolus when she stopped dicumarol® therapy on her own initiative and another had pulmonary infarction when the Quick prothrombin concentration was not kept within the accepted therapeutic range. The third had one episode of a questionable splenic infarct. The fourth, who had been on anticoagulant therapy for ten months, at necropsy had bilateral atrial throm-

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1. Hay, W., and Levine, S. A.: Age and Auricular Fibrillation as Independent Factors in Auricular Mural Thrombus Formation, Am. Heart J. **24**: 1 (July) 1942.

2. (*a*) Wright, I. S., and Foley, W. T.: Use of Anticoagulants in the Treatment of Heart Disease, Am. J. Med. **3**: 718 (Dec.) 1947. (*b*) Foley, W. T., and Wright, I. S.: Long Term Anticoagulant Therapy for Cardiovascular Diseases, Am. J. Med. Sc. **217**: 136 (Feb.) 1949. (*c*) Weisman, S. A., and Feigin, E. V.: Dicumarol and Quinidine in the Ambulatory Treatment of Chronic Auricular Fibrillation, California & West. Med., to be published.

3. (*a*) Weiss, S., and Davis, D.: Rheumatic Heart Disease: III. Embolic Manifestations, Am. Heart J. **9**: 45-52 (Oct.) 1933. (*b*) Griffith, G. C.: Personal communication to the authors.

4. Nichol, E. S.: The Risk of Hemorrhage in Anticoagulant Therapy, Ann. West. Med. & Surg. **4**: 71 (Feb.) 1950.

5. Wright and Foley.[2a,b] Sprague, H. B., and Jacobson, R. P.: Case of Rheumatic Heart Disease with Periodic Arterial Embolism: Ambulatory Treatment with Dicumarol, M. Clin. North America **32**: 1309 (Sept.) 1948.

bosis and embolism, old and recent, in the lungs and kidneys, and myocardial infarction, old and recent, without arteriosclerotic coronary thrombosis. Four patients died of heart failure while receiving dicumarol.® The drug made no appreciable change in the degree or the rate of progression of the heart failure. Seven patients subjectively improved while they were taking dicumarol,® and one who had had repeated episodes of anginal pain had fewer attacks during anticoagulant therapy. The over-all evaluation of the success of continuous therapy in this group was as follows: 11 of the 20 had excellent results, 7 had fair results and treatment failed in 2. Fourteen of the 20 were easy to control by ambulatory methods, and 6 were difficult.

TABLE 2.—*Continuous Dicumarol® Therapy in 20 Cases of Auricular Fibrillation*

Case Number	Age *	Sex	Time Under Treatment (Months)	Indications For Treatment	Average Prothrombin Level (Q P C †)	Average Weekly Dose, Mg.	Complications	Results	Remarks
				Cases of Rheumatic Heart Disease					
1	54	M	2	Repeated systemic emboli	35-40% every 2 weeks	400	None	No emboli during treatment; congestive failure progressed; sudden death; no necropsy	Drug started when patient in terminal congestive failure
2	50	F	24	Repeated systemic emboli	20% 3-4 weeks	350	None	No emboli on therapy, save once when dicumarol stopped	No emboli. Congestive failure continues
3	58	F	10	Repeated systemic and pulmonic emboli	30% biweekly	200	Epistaxis at Q P C of 24%	Continued emboli; death	Poor; at necropsy old and recent atrial clots and myocardial infarction
4	57	M	7	Pulmonary emboli	30% 1-3 weeks	350	Pulmonary emboli at Q P C 40%	Pulmonary emboli	Heart failure progressed; pulmonary infarction less on treatment
5	47	M	28	Cerebral embolus (1)	35-40% monthly	450	None	No further emboli; precordial pain relieved	Results good
6	46	M	25	P A F ‡; repeated emboli	20% biweekly	250	None	No more embolism	Excellent; frequent emboli and hospital entries prior to treatment
7	45	F	6	P A F and cerebral embolus (1)	30%	350	None	No more embolism	
8	58	F	4	Questionable renal emboli	35% biweekly	300	Headache (?)	No embolism	No change on treatment; drug stopped because of headache
9	57	M	20	P A F; no emboli	28% monthly	350	None	No embolism	Good
10	48	F	8	P A F; no emboli	33% 3 weeks	250	None	No embolism	No embolism
Average age...	52.1								
				Cases of Nonrheumatic Heart Disease					
11	53	M	12	Cerebral emboli (3)	28% monthly	250	Conjunctival hematoma at Q P C 18%	No more embolism	Good results
12	61	M	26	Repeated systemic and pulmonic emboli	30% monthly	350	Epistaxis at Q P C 25%, 23%, 15%	No more embolism	Excellent; prior to drug, embolism average every 3 mos.
13	50	F	25	Cerebral emboli	25% 6 weeks	350	None	No more embolism	Excellent
14	79	F	3	Cerebral emboli	32% biweekly	350	None	No more embolism	Stopped after 3 mos.; noncooperative in having tests
15	79	F	12	P A F; systemic and pulmonic emboli	32% 4-5 days	450	None	Less embolism; one splenic infaret while on drug	Fair result
16	58	M	5	P A F; cerebral embolus	25%	450	None	No embolism	Subjectively much improved
17	69	M	10	P A F; no emboli	35% biweekly	350	Hematuria once; responded to vitamin K. Twice severe conjunctival hemorrhage	No embolism	Poor result; prothrombin level less easy to control; repeated hemorrhage
18	61	F	5	P A F; angina pectoris. No emboli	34%	400	None	No emboli or coronary thrombosis	Diminution in frequency and severity of angina
19	54	M	3½	Severe angina; impending coronary thrombosis. No emboli	33% weekly	350	At Q P C of 19% hematoma of tongue	No coronary thrombosis or emboli; continued congestive failure; death	Heart failure continued; no value
20	64	M	24	P A F; no emboli	35% 3 weeks	700	None	No embolism	Good; high maintenance dosage

* Average age 53.2 years. † QPC is Quick prothrombin concentration. ‡ PAF is paroxysmal auricular fibrillation.

METHODS AND COMPLICATIONS

The initial care of all the patients has been the same. Ten or more days of hospitalization established the tentative maintenance dosage of dicumarol.® The prothrombin determinations were then made twice

weekly, then weekly, biweekly and monthly, depending on the individual reaction. The initial dosage in most instances fell near the commonly recommended dosage of 300 mg. the first day, 200 mg. the second day and 100 mg. the third day. There was considerable variation in the subsequent requirements. The dosages required to maintain a therapeutic Quick prothrombin concentration (between 10 and 30 per cent) varied from 200 to 700 mg. per week, whereas the average dose was 50 mg. per day.

Significant complications occurred in only 2 patients. In 1 patient renal hemorrhage occurred with the blood level at a therapeutic Quick prothrombin concentration. The hematuria was controlled by oral and parenteral administration of vitamin K without need of hospitalization. In this same patient minor conjunctival hemorrhage had occurred prior to the renal hemorrhage. Subsequently, after anticoagulant therapy was resumed, the patient had diffuse bilateral conjunctival hemorrhage, which again occurred while the patient was within therapeutic range as determined by the Quick prothrombin concentration. This patient's response to dicumarol® was too unpredictable to allow continuance of ambulatory continuous anticoagulant therapy. A large hematoma developed on the right thigh of the second patient after a fall. Because she was elderly and unsteady on her feet, so that further falls were anticipated, the dicumarol® therapy was discontinued. Other complications in 5 patients were minor: In 2, small hematomas occurred—one in the tongue, the other at the site of a penicillin injection. Among the other 3, brief epistaxis occurred in 1, slight conjunctival hemorrhage in another, and headache in 1, which the patient ascribed to the drug. In comparison with death and the complications for the prevention of which the drug is utilized, these are relatively of negligible importance.

It is apparent from this series that thromboembolism may occur even during anticoagulant therapy. There are several feasible explanations for these episodes:

1. The prothrombin level was not maintained at an effective level.
2. Embolism occurred, not from newly formed intracardiac clots but from clots present before dicumarol® therapy was started.
3. Intracardiac clots formed despite a desirable prothrombin level of the blood.

Recent work indicates that in certain instances intravascular clotting can occur with an apparent therapeutic blood concentration of prothrombin because of a low antithrombin blood level.[6]

COMMENT

Continuous anticoagulant treatment is apparently indicated in patients with rheumatic heart disease and auricular fibrillation who have repeated episodes of thromboembolism. In certain patients dicumarol® therapy seems justifiable even before embolism is recognized. An increased incidence of intracardiac thrombi accounts for the increased incidence of systemic embolism among patients with auricular fibrillation. Among 72 patients with mitral stenosis studied by Harris and Levine[7] in whom cerebral embolism occurred, 3.8 times as many had auricular fibrillation as had normal rhythm. Hernandez[8] found that systemic embolism occurred nearly seven times as frequently in a group with auricular fibrillation as in a group with rheumatic heart disease and normal rhythm. The prevention of formation of these additional clots depends on the administration of anticoagulants at the time of the change from normal rhythm to auricular fibrillation or early in the course of the arrhythmia. This period of transition is rarely observed, save in certain patients with paroxysmal auricular fibrillation. The time of the increased hazard of intracardiac clots and of embolism is often clearly apparent in these patients by the time at which the arrhythmia becomes established.

If systemic embolism has occurred in any patient with auricular fibrillation, the indications for continuous treatment seem defensible. An intracardiac thrombus has formed and has been ejected as an embolus. Unless the mechanism is altered, further embolism would seem eventually inevitable. The studies of Garvin[9] indicate that a high percentage of mural cardiac thrombi are mobilized and ejected as emboli rather than remain dormant.

How does one decide which patients with established auricular fibrillation with heart disease and no embolism to place on continuous dicumarol® therapy? This is a difficult decision to make. It must depend on an analysis of the individual patient. A general analysis based on statistical data, however, is possible. A patient with rheumatic heart disease, congestive failure and auricular fibrillation has a 45 per cent chance of having an intracardiac clot (table 1). There is about a 20 per cent chance that his death will be attributable to thromboembolism.[3] Even if at the moment no intracardiac clots are present, one may form at any time. The life expectancy of a patient with rheumatic heart disease and established auricular fibrillation is about two and one-half years.[10] Faced by such an array of adverse chances, a physician may justifiably choose continuous anticoagulant treatment in certain instances.

In patients with nonrheumatic heart disease and auricular fibrillation the outlook is apparently not as bad. Fewer have intracardiac clots and apparently fewer have as grave thromboembolic episodes, although analogous data are not available. The life expectancy of the natural history of the disease is apparently longer. In elderly patients with arteriosclerosis, the need for preliminary hospitalization and the difficulties of control in an elderly patient whose cooperation cannot always be relied on often outweigh the benefits to be expected from treatment. The physician must think more and more, however, in terms of prevention of the primary mural clots and of treatment before embolism has occurred rather than after the appearance of embolism. The danger of postponement of anticoagulant treatment until embolism occurs is that not infrequently the first embolism may be catastrophic. The first one may be fatal or may cause loss of a limb or permanent hemiplegia. Unfortunately, a properly conducted clinical experiment such as led to the establishment of the value of dicumarol® therapy in myocardial infarction is not possible in patients with auricular fibrillation. In myocardial infarction the duration of the danger period of thromboembolism is relatively short. An observation study period of a few weeks' treatment of each patient was adequate to establish the value of anticoagulant therapy. In other types of heart disease with associated auricular fibrilla-

6. Ochsner, A. S., in discussion on de Takats, G.: Anticoagulant Therapy in Surgery, J. A. M. A. **142**: 527 (Feb. 25) 1950.
7. Harris, A. W., and Levine, S. A.: Cerebral Embolism in Mitral Stenosis, Ann. Int. Med. **15**: 637 (Oct.) 1941.
8. Hernandez, L. M.: Study of Cerebral and Peripheral Emboli Registered in the National Institute of Cardiology of Mexico from September 1944 to May 1946, Am. Heart J. **33**:712 (May) 1947.
9. Garvin, C. F.: Mural Thrombi in Heart as a Source of Emboli, Am. J. M. Sc., **201**: 412 (March) 1941.
10. DeGraff, A. C., and Lingg, C.: The Course of Rheumatic Heart Disease in Adults: III. The Influence of Auricular Fibrillation on the Course of Rheumatic Heart Disease, Am. Heart J. **10**: 630 (June) 1935.

tion the danger of thromboembolism is a constant one, extending over a period of years. Adequate clinical observation of patients receiving anticoagulants would have to cover an infeasible period—probably of years—in order definitely to establish the value of anticoagulants. The justification for the use of dicumarol® continuously in patients with heart disease and auricular fibrillation, therefore, must at the present rest on admitted theoretic concepts.

SUMMARY

Twenty patients with auricular fibrillation associated with rheumatic or arteriosclerotic heart disease have received ambulatory treatment with dicumarol® for four to twenty-eight months, with an average period of treatment of thirteen months. The incidence of thromboembolism in these patients appears to have been decreased from that expected on a statistical basis and on the past history of these patients. Complications due to the anticoagulant therapy were not severe enough to require hospitalization of the patient. The statistical and theoretic grounds justifying the continuous use of anticoagulant therapy in ambulatory patients with auricular fibrillation in heart disease, particularly rheumatic heart disease, are outlined.

COR TRILOCULARE BIATRIUM

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Cor triloculare, or the three-chambered heart, consists of two atria and one ventricle (cor triloculare biatrium) or two ventricles and one atrium (cor triloculare biventriculare). Both types represent rare congenital anomalies, with the former being the commoner of the two.

The earliest reported case of cor triloculare biatrium was by Chemineau in 1699, according to Mehta and Hewlett.[1] However, Holmes[2] in 1824 described a unique heart of this nature in what has since been considered by most workers to be the original account of cor triloculare biatrium. Others[3] contributed additional cases in subsequent years, but the most comprehensive report was presented by Maude Abbott.[4] In her statistical analysis of 1,000 cases of congenital cardiac disease, 13 cases are reported in which cor triloculare biatrium is the primary lesion, and 14 additional cases are presented in which other concomitant congenital defects are present. Thus, the incidence of cor triloculare biatrium represents 2.7 per cent of hearts with congenital anomalies. These had an average life span of seven and three-quarter years. Although her oldest patient was aged 35 years, others including Hedinger[5] and Mehta and Hewlett[1] reported patients living to 56 years. Because cases of cor triloculare biatrium are rarities, we are reporting our experience with this anomaly.

REPORT OF CASE

History.—A white boy aged 20 months and weighing 21 pounds (9,525 Gm.) was admitted to the pediatric ward with the following history: He was a full term infant weighing 6 pounds, 4 ounces (2,835 Gm.), whose neonatal period was complicated by his failure to gain weight in spite of a wide variety of formulas. A diagnosis of congenital heart disease was made when he was 6 weeks of age. At 20 months of age he was unable to sit, stand, crawl, walk or talk.

From 13 to 17 months of age he experienced four syncopal attacks, consisting of rigidity, apnea and cyanosis, subsequent to bouts of screaming. During this period constant fretfulness and progressive abdominal enlargement were noted. At 17 months he presented mild cyanosis of his mucous membranes and fingernail beds, which became pronounced with crying. There was a loud precordial systolic murmur, with maximum intensity over the pulmonic area, and a diastolic murmur over the same area which was transmitted down over the body of the heart. When the child cried his heart rate slowed appreciably. This was suggested as a possible cause for the syncopal attacks. Fluoroscopy revealed decided cardiac enlargement to the left, and an electrocardiogram demonstrated both right and left ventricular hypertrophy and also large P waves. A tentative diagnosis of pulmonary stenosis and insufficiency with possible slight overriding of the aorta was made pending angiocardiography and cardiac catheterization at a more feasible age.

When the child was 19 months of age syncopal attacks became more frequent. Also, edema of the face, trunk and extremities appeared with a weight gain of 7 pounds (3,175 Gm.) in ten days. Since the possibility of a superimposed nephrosis was suspected, the child was hospitalized on Jan. 24, 1949.

Physical Examination.—On admission, physical examination disclosed a well-proportioned, apathetic child with a pasty complexion, edema of the forearms and feet, and a protruding abdomen. Respirations were rapid, labored and grunting. He was disinterested, made no effort to speak and did not sit, stand or crawl. A faint violaceous hue to his lips and fingernail beds was apparent. The cervical and abdominal veins were distended. There was impairment to percussion over the lower lobe of the right lung posteriorly, and breath sounds over this area were distant with fine crepitant rales. Cardiac examination revealed systolic blood pressure of 99, and the diastolic was not obtainable. The pulse rate was 108 per minute. The apical impulse was in the fifth interspace, ½ inch (1.27 cm.) lateral to the midclavicular line. The right border of the heart was ¼ inch (0.64 cm.) to the right of the right parasternal line. A loud, rough systolic murmur was heard over the entire precordium with its maximum intensity along the left border of the sternum, between the second and fourth interspaces. A diastolic murmur was heard at the third left interspace. The aortic second sound and the pulmonic second sound were equal in intensity. The diaphragm was unusually high. An enlarged, smooth, nontender liver with a sharp edge was felt 1½ inches (3.8 cm.) below the costal margin. Although no fluid wave was obtainable, flank dulness pointed to ascites.

From the Pediatric Service and Pathological Laboratories of Mount Sinai Hospital.

Dr. David R. Meranze, Director of Laboratories of Mount Sinai Hospital, reviewed pathologic specimens and assisted in assembling this manuscript.

1. Mehta, J. B., and Hewlett, R. F.: Cor Trilocular Biauriculare: Unusual Adult Heart, Brit. Heart J. **7**: 41, 1945.

2. Holmes, A. F.: Montreal M. J. **30**: 522, 1901; reprinted by Abbott from Trans. Medi.-Chir. Soc. Edinburgh, **1**: 252, 1825.

3. (*a*) Favorite, G. O.: Cor Biatriatum Triloculare, with Rudimentary Right Ventricle, Hypoplasia of Transposed Aorta, and Patent Ductus Arteriosus, Terminating by Rupture of Dilated Pulmonary Artery, Am. J. M. Sc. **187**: 663, 1934. (*b*) Drey, N. W.; Strauss, A. E., and Gray, S. H.: Functional Cor Biatriatum Triloculare: A Report of Case with Malformed Ventricular Septum and Normal Position of Great Vessels, Am. Heart J. **16**: 599, 1938. (*c*) Kornblum, D.: Functional Cor Triloculare Biatria: Report of Case with Malposition of Septum in Ventricles, Am. J. Path. **11**: 803, 1935. (*d*) Glendy, M. M.; Glendy, R. E., and White, P. D.: Cor Biatriatum Triloculare: Case Report, Am. Heart J. **28**: 395, 1944. Rukstinat, G. J.: Aortic Stenosis, Atresia, and Adult Coarctation Associated with Triloculate Heart, Arch. Path. **26**: 102 (July) 1938. Moskowitz, S. L.: Dextrocardia and Cor Triloculare, Rocky Mountain M. J. **39**: 112, 1942. McRea, E. F. W.: Case of Cor Triloculare Biatria, Lancet **1**: 1077, 1927. Von Rokitansky, C.: Die Defecte der Scheidewände des Herzens, Vienna, Braumüller, 1875, pp. 27 and 29. Marchand, F.: Eine seltene Missbildung des Herzens eine Erwachsenen (Transposition der grossen arterien bei rudimentärem rechten Ventrikel), Verhandl. d. deutsch. path. Gesellsch. **12**: 174, 1908. (*e*) Spitzer, A.: Ueber den Bauplan des normalen und missbildeten Herzens, Versuch einer phylogenetischen Theorie, Virchow's Arch. f. path. Anat. **243**: 81, 1923. (*f*) Theremin, C.: Études sur les affections congenitales du coeur, Paris Observation, **43**: 76, 1895. Mann, J. D.: Cor Triloculare Biatriatum, Brit. M. J. **1**: 614, 1907. Peacock, T. B.: Case of Malformation of the Heart, Path. Soc. London Tr. **6**: 117, 1854-1855. Chiari, H.: Ueber ein Cor triloculare (unoventriculare biatriatum) bei einem 4½ jährigen Knaben., Jahrb. f. Kinderh. **14**: 219, 1879; abstracted, Dublin J. M. Sc. **71**: 384, 1881. (*g*) Gnai, S. K.: Congenital Anomaly of the Heart, Am. J. Path. **11**: 309, 1935. (*h*) Mills, E. S.: Cor Triloculare Biatriatum with Coarctation of the Aorta and Anomaly of the Coronary Arteries, J. M. Research **44**: 257 (Dec.) 1923.

4. Abbott, M. E.: Atlas of Congenital Cardiac Disease, New York, 1936, American Heart Association, p. 50.

5. Hedinger, E.: Transposition der grossen Gefässe bei rudimentärer linker Herzkammer bei einer 56 jährigen Frau, Centralbl. f. allg. Path. u. path. Anat. **26**: 529, 1915.

Pitting edema (2 plus) of the lower extremities was present.

Laboratory Data.—Urinalysis showed a pronounced trace of protein, 2 to 4 white blood cells, 10 hyaline casts, and no doubly refractile bodies. Examination of the blood revealed hemoglobin, 15.95 Gm. (110 per cent), and a white blood cell count of 8,900, with a normal differential. Results of other blood studies were: total protein 5.1 Gm., albumin 3.6 Gm. and globulin 1.5 Gm., per hundred cubic centimeters; the albumin-globulin ratio was 2.4:1; the cholesterol level was 272 mg., cholesterol esters 190 mg. (62 per cent), fasting blood sugar 91 mg. and blood urea nitrogen 12 mg., per hundred cubic centimeters. Values for the glucose tolerance test while the patient was fasting and after ½, 1 2 and 3 hours were 102, 148, 168, 124 and 110 mg. per hundred cubic centimeters, respectively.

Other Studies.—A teleoroentgenogram revealed pulmonary congestion of the lower lobe of the right lung, tremendous cardiac enlargement in its transverse diameter, with pronounced bulging of the pulmonary artery segment. Oblique roentgenograms with barium swallowing function demonstrated evidence of an enlarged left auricle. Fluoroscopic examination was suggestive of a large, high interventricular septal defect. The electrocardiogram at the time of admission presented abnormal P waves in lead 2, suggesting auricular dysfunction,

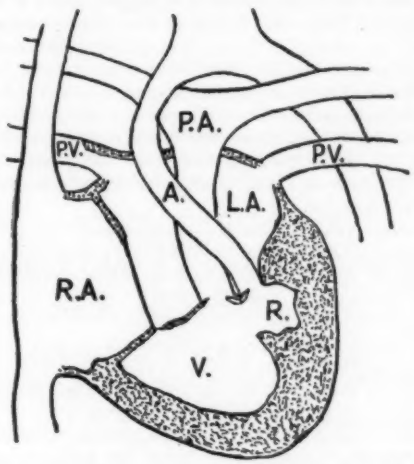


Diagram of heart showing: R., rudimentary outlet chamber; V., ventricle; A., aorta; P.A., pulmonary artery; P.V., pulmonary veins; R.A., right auricle, and L.A., left auricle.

and there was also decided right axis deviation. A repeat tracing six days later also revealed left ventricular hypertrophy.

Treatment and Course.—Treatment of the child during this period consisted of continuous oxygen administration, a salt poor diet, phenobarbital, vitamins and oral digitalis. On this regimen the child manifested both subjective and objective improvement. However, on Feb. 4, 1949, fourteen days after admission, his temperature spiked at 103 F. (rectally) and he became decidedly dyspneic and cyanotic. Both physical examination and roentgenograms of the chest were diagnostic of a widespread bronchopneumonic process involving both lungs. Parenterally administered penicillin, streptomycin, aureomycin and a triple sulfonamide preparation were given alone and in combination. Meralluride sodium, gamma globulin and plasma transfusions were also given. The temperature continued to range from 100 to 106 F. (rectally) for thirteen days. During this period gross blood, bile, pus and numerous hyaline and granular casts appeared in the urine. His white blood count mounted to 20,400 with a differential of 38 per cent segmented neutrophils, 17 per cent nonsegmented cells, 40 per cent lymphocytes and 5 per cent monocytes. The hemoglobin dropped to 11.9 Gm. (76 per cent). A urine smear and culture were negative, and several blood cultures were also negative. A nasopharyngeal culture produced Staphylococcus albus and diphtheroids. The prothrombin time was 31 per cent of normal.

On Feb. 17, 1949 the temperature returned to normal and the child seemed clinically improved. However, a roentgenogram of the chest on February 21 revealed progression of the pneumonic process and several blood counts demonstrated a decided leukocytosis (as high as 33,500) and anemia with 9.5 Gm. (66 per cent) hemoglobin, and 2.6 million red blood cells, including 19 to 29 nucleated red cells per hundred leukocytes. Of the antibiotic agents which had been given jointly for about two weeks, only penicillin was continued. After the administration of crude liver extract parenterally, folic acid orally and a tibial transfusion, the hemoglobin level rose to 11.3 Gm. (78 per cent) and the white blood cell count dropped to 10,900. Nevertheless, on February 27 the patient again had a fever, which rose rapidly to 106 F. (rectally); on March 2, 1949, the thirty-seventh day of hospitalization, he had convulsions and expired.

Report of the Pathologist.—External Examination: The body was that of a small, thin, white 22 month baby boy measuring 75 cm. Pallor was pronounced. There was a small decubitus ulcer 1.5 cm. in diameter to the left of the lower end of the sacrum.

Internal Examination: The subcutaneous fat was scant. Each pleural cavity contained approximately 50 cc. of clear amber fluid. The pericardial cavity contained approximately 40 cc. of similar fluid. The lungs showed moderate to severe diffuse congestion and edema. Disseminated focal, reddish brown areas of bronchopneumonia were noted throughout both lungs. Except for the heart, the other viscera were not remarkable.

Heart: The heart was decidedly enlarged both to the right and left; it extended to the left anterior axillary line and weighed 148 Gm. The heart had four chambers; two auricles, a single large ventricle and a rudimentary outlet chamber. A large pulmonary artery and a diminutive aorta emerged from the heart. The superior and inferior vena cava and the usual number of pulmonary veins entered the heart in their normal position. (See the accompanying illustration.)

The single ventricle was the largest of all the chambers. A rudimentary outlet chamber lay above and to the left of the main ventricular chamber in the region of the heart normally occupied by the pulmonary conus. A muscular ridge partially separated the main ventricular chamber from the rudimentary chamber. There was an opening in this partition measuring 4 cm. in circumference (1.2 cm. in diameter) through which the two chambers communicated. The volume capacity of the rudimentary outlet chamber was approximately 15 cc. The wall of the single ventricle averaged 10 to 12 mm. anteriorly. The wall of the outlet chamber measured 8 mm. laterally and 10 to 12 mm. anteriorly. The posterolateral wall of the large ventricle showed diffuse fibrosis and averaged 7 mm. over a roughly circular area 3 cm. wide. The right atrium was slightly dilated and was entered by the superior and inferior vena cava. The left atrium was moderately dilated. An anatomically patent foramen ovale was present. On its right atrial aspect the foramen was partially covered by a crescentic membranous fold. The circumferences of the heart valves measured: tricuspid, 8 cm.; pulmonic, 5.5 cm.; mitral, 7 cm., and aortic, 4 cm.

The large pulmonary artery arose from the single ventricle and was 5.5 cm. in circumference. The diminutive aorta arose from the rudimentary outlet chamber and measured 3.5 cm. in circumference. Since the latter lay in the region normally occupied by the pulmonary conus of the right ventricle, this represented a true transposition of the great vessels. A thin partition of muscular tissue separated the great vessels at their origin. For a distance of 4 cm. the pulmonary artery and the aorta were closely adherent. At about this level the ductus arteriosus was present and was represented by a cylindrical band measuring 5 mm. in length and 3 mm. in diameter. The duct was obliterated, and each orifice was represented by a small dimple. The aorta crossed in front of the pulmonary artery and continued as the arch, giving off its three main branches in the usual manner. The coronary arteries normally arose from the aorta and were adequately patent in their proximal courses.

COMMENT

Cor triloculare biatrium is a malformation resulting in an extremely early arrest in the development of the heart. It includes all hearts which consist of two auricles and one ventricle as well as those which have a rudimentary cavity in addition to the ventricle. This cavity is incompletely separated from the ventricle by a muscular ridge and contains either the aorta or pulmonary artery, or both; it lies in the region normally occupied by the pulmonary conus of the right ventricle. Although anatomically a four-chambered heart, it functions as a three-chambered organ. Favorite [3a] established the criteria of cor triloculare biatrium:

1. A common large ventricle receiving the auriculoventricular orifices and the orifice of one of the great vessels.

2. Defective interventricular septum.

3. One of the great vessels leading into the rudimentary ventricle.

In the normal embryologic development of the heart the primitive cardiac tube bulges forward and swings to the right, with the anterior portion becoming the bulbus cordis and the posterior part the common ventricle. A single great vessel arises from the bulbus cordis. Coincidental with the atrophy of the ridge separating the bulbus cordis from the common ventricle, the arotic septum develops and the aorta arises from the common ventricle posterior to the bulbus cordis. The anterior portion of the bulbus cordis develops into the pulmonary conus of the right ventricle, from which the pulmonary artery arises. In the case of cor triloculare biatrium, ventricular development is halted at this point, with the bulbus cordis persisting as the rudimentary outlet chamber. The arrest in the development of the heart may occur so early that both great vessels arise from the diminutive chamber, or one may arise from the common ventricle and one from the outlet chamber.[6]

In circumstances closer to normal, the aorta arises from the common ventricle and the pulmonary artery from the rudimentary chamber. The original case reported by Holmes [2] in 1824 and that reported subsequently by Drey, Strauss and Gray [3b] in 1938 were of this type. However, it is much commoner to discover a malformation of the great vessels in association with the arrested development of the ventricles, i. e., a transposition of the great vessels. In these circumstances the aorta arises from the diminutive chamber and the pulmonary artery from the common ventricle. Usually the vessel which arises from the rudimentary chamber is diminutive in size, and that which arises from the common ventricle is normal in size. Lewis and Abbott [7] attempted to explain the difference that exists between the original case reported by Holmes, without transposition of vessels, and the usual case of cor triloculare in which there is complete transposition of the great vessels. They assumed that the latter hearts were developed on a reversed ventricular loop, thus producing the transposition of vessels, while the Holmes heart was developed in the normal embryologic position. Hence, the basis of the transposition rests with a situs inversus of the ventricles and a primary malposition of the interventricular septum. Varying interpretations have been given regarding the pathogenesis of the anomalous interventricular septum of the Holmes heart. Abbott [8] stated his belief that Holmes must have considered the septum between these two cavities to be the malposed interventricular septum, because he referred to the rudimentary cavity as the right ventricle and to the common ventricle as the left one. Gnai [3g] interpreted the anomalous septum as being produced by atrophy of the cardiac bulb and hypertrophy of the left ventricle. Kornblum [3c] assumed that the septum develops to the right of the right auriculoventricular orifice. Of great importance are the contributions of Spitzer,[3e] whose theory is based on the phylogenetic relationships existing between the human and the reptilian heart.

The degree of lowered oxygen saturation and cyanosis in cor triloculare biatrium is dependent not only on the admixture of arterial and venous blood in the large ventricle but on the location of the great vessels in the heart. If both vessels arise from the rudimentary chamber and are approximately the same size, an equal volume of blood is delivered through both. The result is an equal mixture of arterial and venous blood, producing definite cyanosis. If the pulmonary artery arises from the main ventricle a large volume of blood reaches the lungs for aeration, therefore cyanosis is minimal or absent. When the situation is reversed, with the abnormally small pulmonary artery originating from the rudimentary chamber and the normal-sized aorta springing from the common ventricle, cyanosis is intense. In this instance the body receives a greater volume of blood through the more adequately sized aorta, but only a small amount of blood reaches the lungs for aeration.

Although the chances for survival are enhanced by transposition of the great vessels, the volume of oxygenated blood which reaches the systemic circulation is meager because of the diminutive size of the aorta. Consequently, anoxia of body tissues results and the patient usually manifests physical and mental retardation, and no amount of inhalation of oxygen will restore the oxygen saturation of the arterial blood to normal. This was true in our case (see the figure).

In cor triloculare biatrium the cardiac observations are extremely variable. At birth, the heart is usually normal in size, and any enlargement which may occur appears so slowly that it is discovered only in the rare instances in which the patient survives for several years. Initially a murmur may or may not be present, but one usually develops as the heart enlarges. Murmurs which occur are not characteristic of the malformation but do lack the rasping quality associated with most congenital cardiac defects. At times a differentiation from rheumatic heart disease must be made.

The roentgenologic and fluoroscopic observations in this malformation are of the utmost significance in diagnosis. In the anteroposterior position there is decided dilatation of the pulmonary conus, suggesting right ventricular enlargement. In the left anterior-oblique position there is no evidence of such dilatation, indicating that the exaggerated shadow in the region of the pulmonic segment is in reality the rudimentary outlet chamber. If survival for several years occurs, the heart enlarges and the apparent pulmonary conus prominence disappears. The contour of the heart remains the same regardless of the position of the great vessels. However, the hilar shadows differ according

6. Taussig, H.: Congenital Malformations of the Heart, London, Oxford University Press, 1947, pp. 278-296.

7. Lewis, F. T., and Abbott, M. E.: Reversed Torsion of the Ventricular Bend of the Embryonic Heart in the Explanation of Certain Forms of Cardiac Anomaly, Ann Arbor, Mich., Internat. A. M. Museums Bull. 1916, p. 111.

8. Abbott, M. E.: Congenital Cardiac Disease, in Osler, W.: Modern Medicine, revised and reedited by T. McRea and E. Funk, ed. 3, Philadelphia, Lea & Febiger, 1927, vol. 4, chap. 21, p. 612.

to their position. If the pulmonary artery emanates from the common ventricle there is an excessive blood supply to the lungs, producing severe pulmonary congestion. The hilar shadows may be diminished or absent if the pulmonary artery with its characteristic decreased caliber originates from the outlet chamber. If the aorta is located in the outlet chamber, the aortic shadow is narrow; the reverse is true if the aorta is located in the common ventricle. In this latter situation the architecture of the heart simulates a tetralogy of Fallot. The electrocardiogram is of little diagnostic aid. Right axis deviation and disturbances of intraventricular conduction time may or may not exist.

Although the prognosis is poor, since only occasional patients survive infancy, a surgical approach has been successfully devised for particular cases. In instances like that of the Holmes heart, in which there is no transposition and severe pulmonary stenosis, benefit has been obtained by a Blalock-Taussig operation. In such circumstances the pulmonary artery, with its decreased pressure, permits a flow of blood from the aorta. It is obvious that benefit could not be obtained if both vessels arose from the common ventricle and had the same pressure.[6]

SUMMARY

1. The rare congenital cardiac anomaly of cor triloculare biatrium in a boy 22 months of age is reported.

2. The embryologic, pathologic and physiologic observations, together with roentgenologic, electrocardiographic and fluoroscopic evaluations are discussed.

Council on Physical Medicine and Rehabilitation

REPORT OF THE COUNCIL

The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

HOWARD A. CARTER, *Secretary.*

TELEX HEARING AID, MODEL 200, ACCEPTED

Manufacturer: Telex, Inc., Telex Park, Minneapolis.

The Telex Hearing Aid, Model 200, is designed for the rehabilitation of the hard of hearing. It is an electric hearing aid weighing 141 Gm. with batteries and measuring 60 by 82 by 18 mm. The instrument operates on zinc-carbon batteries, the A-battery at 1.5 and the B-battery at 15 volts.

Electroacoustic and clinical data from sources acceptable to the Council showed that this instrument was of good construction and satisfactory in operation. The Council on Physical Medicine and Rehabilitation voted to include the Telex Hearing Aid, Model 200, in its list of accepted devices.

CLEARTONE HEARING AIDS, MODEL 500 AND REGENCY MODEL, ACCEPTED

Manufacturer: American Sound Products, Inc., 2454 South Michigan Avenue, Chicago 16.

Model 500 of the Cleartone Hearing Aid is housed in a case that measures 113 by 61 mm. and tapers from a thickness of 22 mm. above to 18 mm. below. The weights are as follows: Case with contents except batteries, 122 Gm.; batteries, 64 Gm., and receiver with cord, 12 Gm. The total weight is 198 Gm.

The instrument requires a 1.4 volt zinc-carbon A-battery, a 22.5 volt zinc-carbon B-battery and a C-battery.

The Regency Model of the Cleartone Hearing Aid is slightly smaller and lighter than its companion, Model 500. The Regency Model is housed in a case that measures 96 by 61 mm. and tapers in thickness from 22 mm. above to 18 mm. below. The case with its contents, except batteries, weighs 111 Gm.; the batteries weigh 48 Gm., and the receiver with its cord weighs 12 Gm. The total weight is 171 Gm. The following batteries are required: Zinc-carbon A-battery, 1.4 volts; zinc-carbon B-battery, 22.5 volts, and C-battery, mercury bias cell, 1.4 volts.

Evidence from acceptable sources indicated that these instruments are well constructed and perform as claimed by the manufacturer. The Council on Physical Medicine and Rehabilitation voted to include the Cleartone Hearing Aids, Model 500 and the Regency Model, in its list of accepted devices.

CROUPETTE HUMIDITY AND OXYGEN TENT ACCEPTED

Manufacturer: Air-Shields, Inc., County Line Road, Hatboro, Pa.

The Croupette Humidity and Oxygen Tent is designed for use in the treatment of respiratory ailments where either high humidity or high oxygen concentrations, or both, are indicated. It consists of a light metal framework, a transparent plastic tent to be supported by the framework, a container for ice and a humidifying unit. When the apparatus is to be used with compressed oxygen, the oxygen regulator has to be connected with a nipple at the top of the jar, which is part of the humidifying unit. When the apparatus is to be used simply with air, an electrically driven air compressor is needed to supply a pressure of 8 to 10 pounds per square inch (410 to 520 mm. of mercury), which serves the double purpose of forcing the air through the nebulizer and insuring constant change of air within the tent. The firm offers for this purpose a motor compressor unit which operates on a 60 cycle alternating current at 110 volts. The tent being constructed as it is, the occupant is at atmospheric pressure which is not affected by the pump.

Complete Humidity and Oxygen Tent

This tent is intended to provide for the patient a cool nebulizer spray with humidities up to 95 per cent or higher and with minimum condensation, at the same time maintaining oxygen concentrations from 45 to 65 per cent. Unpacked, the apparatus weighs 7.3 Kg. (16 pounds). Packed for shipment it makes a package measuring 68 by 27 by 72 cm. (26¼ by 10½ by 28¼ inches). The domestic shipping weight is 11.8 Kg. (26 pounds), and the foreign, 19.9 Kg. (44 pounds). These figures do not include the motor compressor unit, which is an optional accessory.

Evidence obtained from sources acceptable to the Council indicated that the apparatus worked as represented by the manufacturer. The Council on Physical Medicine and Rehabilitation voted to include the Croupette Humidity and Oxygen Tent in its list of accepted devices.

MIDWEST ALL-METAL HUMIDIFIER, MODEL 100, ACCEPTED

Manufacturer: Mid-West Oxygen Equipment Company, 4208 Lincoln Avenue, Chicago 18.

The Midwest All-Metal Humidifier, Model 100, is a device designed for attachment to cylinders containing oxygen for clinical use, so that the gas as it leaves the cylinder can be passed through water. It has the general form of a cylinder about 14 cm. (5½ inches) in height and 7 cm. (2¾ inches) in diameter and is equipped with a water-level gage on the side. The weight, unpacked, is 1.6 Kg. (4 pounds 9 ounces); the shipping weight is 2.4 Kg. (5 pounds 4 ounces).

Evidence was obtained that the device performs as represented by the manufacturer, and the Council on Physical Medicine and Rehabilitation voted to include the Midwest All-Metal Humidifier, Model 100, in its list of accepted devices.

Council on Pharmacy and Chemistry

REPORT TO THE COUNCIL

The Council has authorized publication of the following report from the Committee on Pesticides.

R. T. STORMONT, M.D., *Secretary.*

Among the functions of the Committee on Pesticides is the integration and interpretation of available data on pesticidal chemicals for the information of physicians. The following article is the first of a series on aspects of pesticides which are of immediate medical interest. It discusses three organic phosphorus compounds which are now commercially available and rather generally used in insecticides.

This series is not intended as a complete review of the many facets of pesticidal information. It will, however, form the basis for such an undertaking when monographs on individual pesticidal chemicals or groups of chemicals are prepared for the Committee's publication on pesticides.

BERNARD E. CONLEY, *Secretary, Committee on Pesticides.*

PHARMACOLOGY AND TOXICOLOGY OF CERTAIN ORGANIC PHOSPHORUS INSECTICIDES

GENERAL DESCRIPTION OF THEIR ACTIVITY AND USEFULNESS

S. A. ROHWER, D.Sc. and H. L. HALLER, Ph.D.
Washington, D. C.

Shortly after the termination of the last war information became available on certain organic phosphorus compounds which had been developed in Germany as insecticides. The products which received first recognition and use in this country are now known as hexaethyl tetraphosphate (HETP), tetraethyl pyrophosphate (TEPP) and parathion. The first two of these are mixtures of esters, the principal active insecticidal agent of which is tetraethyl pyrophosphate. The third, parathion, is an ester of thiophosphoric acid.

HEXAETHYL TETRAPHOSPHATE AND TETRAETHYL PYROPHOSPHATE

Hexaethyl tetraphosphate is a mobile liquid obtained by the reaction of three moles of triethyl phosphate and one mole of phosphorus oxychloride. From its empiric composition $(C_2H_5)_6P_4O_{13}$, it was concluded that the product was an ester of tetraphosphoric acid. It was subsequently shown in this country that the reaction product is essentially a mixture of esters containing ethyl metaphosphate, triethyl orthophosphate and 15 to 20 per cent tetraethyl pyrophosphate (the principal insecticidal component). By increasing the proportion from three to five moles of triethyl phosphate to one of phosphorus oxychloride, a liquid product possessing the empiric composition $(C_2H_5)_4P_2O_7$ is obtained. But this product, designated as tetraethyl pyrophosphate, is, like hexaethyl tetraphosphate, also an equilibrium mixture of esters, the principal active ingredient of which is about 40 per cent of tetraethyl pyrophosphate. Both hexaethyl tetraphosphate and tetraethyl pyrophosphate may also be obtained from triethyl phosphate and phosphorus pentoxide. The products derived by this reaction exhibit essentially the same biological activity as that obtained from triethyl phosphate and phosphorus oxychloride.

Commercial hexaethyl tetraphosphate and tetraethyl pyrophosphate prepared by either of the above reactions are light straw to amber colored mobile liquids, have specific gravities of 1.28 to 1.29 at 25/25 C. and 1.18 to 1.21 at 25/25 C., respectively. Both are stable compounds at room temperatures but decompose with the formation of ethylene gas at elevated temperatures. They are hygroscopic and miscible with water and many organic solvents but not with kerosene and petroleum ether. When water is present they hydrolyze rapidly to form monoethyl and diethyl orthophosphoric acids. The products of hydrolysis have no insecticidal value and appear to be harmless to warm-blooded animals.

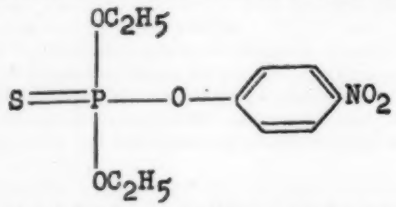
Hexaethyl tetraphosphate and tetraethyl pyrophosphate are not used alone as insecticides but are mixed with other materials to make sprays, dusts or aerosols. These are used principally as contact poisons for the control of aphids, mites and thrips. They are not used for the control of insects attacking man or animals or for insects in households, storage rooms and similar places. Although the agents act promptly, their effect is of short duration because hydrolysis occurs rapidly. This greatly reduces the danger of food contamination or operational hazards from residues that remain on treated plants.

Trade names under which the basic chemicals are available to manufacturers of insecticides include nifos, tetron, and vapotone. The insecticidal formulations are sold under such trade names as bladex, hexamite, killex, tetratone, tetron-DX, tetron-50, vapotone bacco spray and vapotone dust.

PARATHION

Parathion is the coined name for the insecticidal chemical, 0,0-diethyl 0-*p*-nitrophenyl thiophosphate of a purity above 95 per cent. This ester of thiophosphoric acid, first prepared in Germany and designated as E-605, was subsequently known in this country under the experimental number 3422.

Parathion possesses the empirical formula $C_{10}H_{14}NO_5PS$, and the following structural formula has been assigned to it:



Commercial parathion is a yellow to deep brown liquid, some samples of which have a characteristic odor usually associated with onions. The boiling point of this compound is 375 C. or higher at 760 mm. pressure; its specific gravity is 1.26 to 1.28 at 25/25 C. It is very slightly soluble in water (about 20 p.p.m.), completely miscible with many organic solvents and practically insoluble in petroleum ether, kerosene and refined spray oils. Parathion is decomposed in the presence of alkaline materials such as lime, lime sulfur, bordeaux and calcium arsenate containing excess lime. It is compatible with many plant insecticides and newer organic insecticides.

Parathion may be obtained by the following sequence of reactions. Thiophosphoryl chloride is allowed to react with sodium ethylate to form 0,0-diethyl chlorothiophosphate. This compound is then permitted to react with anhydrous sodium *p*-nitrophenoxide to form parathion. A purified product is obtained by distillation under greatly reduced pressure. Except in special cases, such as the production of greenhouse aerosols, the distribution of the technical product is limited to firms who prepare formulations of parathion as dusts, wettable powders, emulsifiable concentrates and aerosols.

Trade names such as thiophos, niran and alkron have been given to commercial parathion. The formulated insecticides are produced in various concentrations which are sometimes designated by numbers that accompany the trade name. For example, penphos is the trade name used by one company for its insecticides containing parathion, but the term penphos 15W designates their wettable powder containing 15 per cent of parathion. There are many trade names for insecticides containing parathion. Some of these are aphamite, corothion, genithion, kilphos, mackothion, paradust, paraphos, penphos, plantthion and vapophos.

Parathion acts as a contact and stomach poison and also as a fumigant. It has generally been most useful in the control of aphids and mites, although it has been effectively used for the control of numerous other fruit and vegetable crop insects. In some cases the chemical is absorbed by plants and may remain toxic for several days. Parathion insecticides are not used for the control of insects attacking man or animals or for insects occurring in households and similar places.

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PHARMACOLOGY

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The pharmacology of the organic phosphorus insecticides has been extensively investigated during the past few years, and it has now been well established that the predominant physiologic effects of all members of this group are similar. The outstanding manifestations of acute poisoning by hexaethyl tetraphosphate (HETP), tetraethyl pyrophosphate (TEPP) and parathion resemble those produced by excessive stimulation of the parasympathetic nervous system, the central nervous system and somatic motor nerves. This group of toxic agents may therefore be classified as parasympathomimetic stimulants or, more precisely, as cholinergic agents.

Studies on the mechanism of action of alkyl phosphates show that they are potent inhibitors of cholinesterase. As a result of the inhibition of this enzyme, acetylcholine accumulates in the tissues and produces effects resembling prolonged stimulation of cholinergic nerves. This is the only biochemical effect observed thus far with concentrations compatible with the low doses that produce toxic effects in animals.

Assays of tissues taken from experimental animals poisoned by HETP, TEPP and parathion have shown that a rapid decrease in cholinesterase activity occurs coincident with the rapid appearance of symptoms. Signs of poisoning appear within five minutes after parenteral administration, and death from single lethal doses of HETP and TEPP usually occurs within two hours, although it may be delayed somewhat longer with parathion.

Increase in the rate of respiration is first observed, followed soon by unsteadiness, lack of coordination and scattered muscular twitches. Miosis, defecation, urination, lacrimation and salivation occur regularly. After lethal doses the severity of the symptoms rapidly increases to prostration with generalized muscular fibrillations, body twitching and tonic and clonic convulsions followed by death. Respiratory failure precedes cardiac arrest and the heart generally continues to beat for two to three minutes after cessation of respiration. After single sublethal doses of these agents the cholinesterase activity returns to nearly normal within a few hours and the symptoms disappear. These agents therefore exert a reversible inhibitory effect on cholinesterase, and complete recovery of animals follows the administration of single sublethal doses. After repeated doses, however, an irreversible inactivation of part of the enzyme occurs which leads to a cumulative toxic action. This type of action is more readily demonstrated with parathion than with HETP or TEPP.

Although no evidence of cumulative toxic effect has been observed with TEPP or HETP, animal experimentation has shown that repeated exposure to parathion may result in subacute poisoning. When rats are given a quantity equivalent to one fourth or more of the LD_{50} dose each day, each successive dose produces symptoms which become progressively more severe, until after several days death of the animal occurs. The symptoms preceding death of the animals are identical with those produced by a single acute lethal dose. A progressive decrease in the cholinesterase activity of the tissues accompanies the cumulative action.

The ability of the organic phosphorus insecticides to undergo hydrolysis to inactive products is an extremely important factor because it not only greatly influences the toxicology of these agents, but also determines their ultimate metabolism and fate in vivo. HETP and TEPP are rapidly detoxified through hydrolysis in the body, thus eliminating the possibility of storage in the tissues. Chronic poisoning in experimental animals has not been observed although it is conceivable that repeated inhibition of cholinesterase and perhaps interaction with other cellular constituents over a prolonged period of time might eventually lead to an alteration in biochemical functions with resultant pathologic changes. Parathion is detoxified at a slower rate than TEPP, and subacute poisoning from frequently repeated exposures is thus a possibility.

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Of primary importance with respect to the toxicology of the alkyl phosphates now in use as insecticides is the high inherent toxicity of the agents. Animal experimentation has revealed that among various species there is little difference in susceptibility to HETP, TEPP and parathion; therefore it would be expected that values obtained for experimental animals are applicable to man. By the intraperitoneal route of administration the approximate LD_{50} of HETP for rats is 2.5 mg. per kilogram of body weight, whereas the value by the oral route is 7 mg. per kilogram for this species. The toxicity by inhalation and after intravenous administration closely approximates the intraperitoneal value. Intraperitoneally the approximate LD_{50} of TEPP is 0.65 mg. per kilogram of body weight for rats and 0.85 mg. per kilogram for mice. The LD_{50} of TEPP given orally to rats is 1.4 mg. per kilogram.

Parathion is also highly toxic to all species of animals. By the intraperitoneal route the approximate LD_{50} for male rats is 7 mg. per kilogram as compared with 4 mg. for female rats. This noticeable sex difference in susceptibility has not been observed in humans or in animals with other organic phosphorus-containing insecticides, although a slight variance in response between the sexes has been reported with HETP, female rats being somewhat more susceptible than males. For mice the approximate LD_{50} of parathion given intraperitoneally is 10 mg. per kilogram with no deviation in susceptibility between the sexes being evident. The LD_{50} values for cats and dogs for parathion administered intravenously are 3 to 5 mg. and 12 to 20 mg. per kilogram, respectively. Neither age nor weight within a given species exerts any observable influence on susceptibility to the phosphorus-containing insecticides.

TOXICOLOGY

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The organic phosphorus insecticides are among the most toxic materials commonly used for pest control and are capable of producing severe systemic effects and death unless directions for handling and use are strictly observed. These insecticides may be absorbed through the skin, respiratory tract, conjunctiva, gastrointestinal tract or following injection. Exposure may occur at any stage in the production, packaging, handling or spraying of insecticide preparations of these compounds or in the harvesting of fruits and vegetables on which they have been sprayed and which have insufficiently weathered. On the basis of acute toxicity, TEPP is the most potent member of the group, being from two to three times more toxic than HETP. It is several times more toxic than nicotine. Parathion is less acutely toxic than TEPP or HETP. Of these insecticides, parathion is the most versatile, because of its greater stability in the presence of water and its greater solubility in lipid mediums, including the waxy outer layer of fruit and leaves. Unfortunately these same factors are responsible for the greater over-all danger of parathion when used in the environment of man and domestic animals.

The inhibition of cholinesterase enzymes appears to be partly reversible in man for several hours after a single exposure to these chemicals. After repeated exposure there is a progressive and largely irreversible inactivation of cholinesterase throughout the body. The rate of return of the enzyme in plasma and red blood cells is generally compatible with the time necessary for the regeneration of new enzyme, and it is probable that the cholinesterases of other tissues are also restored chiefly by regeneration of new enzyme. Until the tissue cholinesterases have been restored to normal, subjects who have been exposed to these compounds have increased susceptibility to their effects. Cross sensitization due to successive exposures to two or more organic phosphate insecticides may produce additive effects similar to those resulting from repeated exposures to a single preparation. Many persons who have had moderate or severe symptoms due to organic phosphate insecticides had been exposed repeatedly before the onset of symptoms, although there have been reports of poisoning from single exposures. The local

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action of the organic phosphate compounds on the eye varies greatly, a difference which is particularly important to spray pilots. HETP and TEPP, even in dilute solutions, will cause myosis. The maximum concentrations of parathion which are recommended for spraying do not produce myosis nor interfere with the light reflex. Systemically, of course, toxic doses of parathion do produce myosis. These chemicals do not produce local inflammatory changes in the skin, so that absorption by this route may go undetected until other symptoms begin. When symptoms do begin, there may be little warning of impending serious effects, since there seems to be a fairly narrow margin between pharmacologic effect and doses that are lethal. It is probable that the cholinesterase activity of the tissues may be considerably reduced without the appearance of any warning symptoms, while a further reduction below the level compatible with normal function may result in marked symptoms and even death.

The fatal dose of the alkyl phosphates for man has not been established. The single dose of TEPP that will produce moderately severe symptoms in man is approximately 5 mg. intramuscularly and 25 mg. orally. The dose of TEPP that will produce moderately severe symptoms after absorption through the skin cannot be estimated. In the case of a related organic phosphate anticholinesterase agent, di-isopropyl fluorophosphate (DFP), whose dose-effect relationship in man is similar to that of TEPP, the single cutaneous dose that will probably produce moderate symptoms is estimated to be about 100 mg. (0.1 cc.). The single doses of these compounds that would probably be lethal are therefore estimated to be about 20 mg. intramuscularly, 100 mg. orally and (for DFP) 500 mg. (0.5 cc.) cutaneously. The equal toxicity of parathion and DFP for experimental animals and the general similarity of their effects in man suggest that the dose-effect relation of parathion for man may also approximate that of DFP.

The toxic manifestations of the organic phosphorus insecticides are similar and are referable to the postganglionic cholinergic nerves (muscarine-like effects) and the preganglionic and somatic motor nerves (nicotine-like effects) and the central nervous system. The muscarine-like effects are the earliest and commonest signs of poisoning.

MUSCARINE-LIKE EFFECTS

The first symptoms to appear are usually anorexia and nausea. These are soon followed by vomiting, abdominal cramps, excessive sweating, salivation and usually some degree of pupillary constriction. If the exposure is extensive, diarrhea, tenesmus, involuntary defecation and urination, pallor, pinpoint nonreactive pupils, blurred vision, excessive bronchial secretion, sometimes respiratory difficulty (suggestive of bronchoconstriction) and pulmonary edema with cyanosis follow. The respiratory manifestations are most severe when the respiratory tract is one of the routes of absorption. Elevation of the blood pressure is common during severe intoxication due to parathion.

NICOTINE-LIKE EFFECTS

Muscular fasciculations in the eyelids and tongue are early signs. If the exposure is extensive, these are followed by fasciculations in the muscles of the face and neck and in the extraocular muscles (resulting in jerking movements of the eyes) and then by generalized fasciculations and weakness. In the severest cases there may be weakness of the muscles of respiration.

CENTRAL NERVOUS SYSTEM EFFECTS

Giddiness, uneasiness, restlessness, anxiety and tremulousness occur early, followed by headache and sometimes by the sensation of "floating," insomnia and excessive dreaming. If the exposure is extensive, ataxia, tremor, drowsiness, difficulty in concentrating, mental confusion and occasionally disorientation develop. Paresthesias are common after exposure to TEPP, while changes in speech consisting of slurring, difficulty in forming words and multiple repetition of the last syllable may occur after parathion. In very severe cases this is followed by coma, with the disappearance of all reflexes, and then by generalized convulsions. During the coma there may be Cheyne-Stokes respiration.

DURATION OF SYMPTOMS

The acute effects last six to thirty hours. If these manifestations are severe, it is common for mild anorexia, giddiness, anxiety, headache and weakness to persist for 48 to 72 hours and occasionally for as long as three weeks after the last exposure. In some subjects the pupils may not return to normal size for three to six weeks, probably because the insecticide has been sprayed or rubbed into the eyes.

The average time interval between the last exposure to parathion and death has been 10½ hours and between the onset of symptoms and death nine hours. The sequence of terminal events appears to be as follows: Respiration becomes shallow, labored and rapid, and in some instances there is pulmonary edema and cyanosis; then the blood pressure falls and becomes unobtainable; death ensues. Contributing factors are believed to be depression of the respiratory and circulatory centers, weakness of the muscles of respiration and, in some instances, pulmonary edema. After death due to this chemical there is usually capillary dilatation, hyperemia and edema of the lungs, sometimes of the brain as well, and occasionally of all the organs. Parathion may be detected chemically in the organs. The cholinesterase activity of the various parts of the brain and of the liver and kidneys is depressed 22 to 88 per cent of the average normal value and that of the plasma and red blood cells to below 20 per cent of normal.

Symptoms due to the organic phosphorus insecticides are treated chiefly with atropine, which has a moderate inhibitory effect on the muscarine-like and a less striking effect on the central nervous system manifestations. Patients who have moderately severe symptoms due to these compounds have an increased tolerance for atropine. It is recommended that 2 mg. of atropine be administered intramuscularly at hourly intervals, or more often if necessary, until signs of atropinization appear. The dose of atropine may then be reduced, but its administration should be continued as long as any muscarine-like symptoms are present. Atropine should not be administered prophylactically unless the patient can be observed for 24 hours, as it may delay the symptoms of poisoning. Adjuvants to atropine therapy include washing the skin, ocular irrigation and gastric lavage to remove any unabsorbed insecticide, parenteral replacement of fluids, administration of oxygen and tracheal intubation and artificial respiration if necessary. If convulsions are severe, the careful administration of ether or of a short acting barbiturate may be of value. Morphine should not be administered because it depresses respiration. The acute emergency lasts 24 to 48 hours, and the patient must be closely watched. Susceptibility to relatively small amounts of alkyl phosphates continues until the regeneration of blood and tissue cholinesterase is nearly complete. This usually requires several weeks, so that further exposure to organic phosphorus anticholinesterase compounds should be avoided during this period. The diagnosis of intoxication depends mainly on an awareness of the syndrome and a high index of suspicion in areas where these organic phosphorus insecticides are being used. Reduced cholinesterase activity in the plasma and red blood cells is confirmatory evidence.

The organic phosphorus compounds and insecticides must be treated with extreme caution by all who have occasion to be exposed to them. There are certain differences between parathion on the one hand and TEPP and HETP on the other, which are reflected in the safety equipment needed for protection. This is true particularly of masks and respirators. Safety measures to reduce the degree of exposure and minimize absorption include:

1. To reduce absorption through the skin, clean protective clothing is required. The character depends on the nature of the product and degree of exposure. Workmen engaged in the manufacture of the chemical, formulation or blending of insecticides should wear complete protective equipment including natural rubber gloves, goggles, rubber overshoes and aprons. Workmen engaged in applying insecticides need not use rubber aprons and rubber overshoes, if care is exercised. All clothing worn by workmen should be washed before reuse. Plant operators should never wear work clothes home. If these poisons contact the skin, work should be stopped at once, and

the victim should wash thoroughly with soap and water and change to clean clothes. If contact with the eye occurs, irrigation with isotonic sodium chloride solution should be started immediately and continued for at least a quarter of an hour. Workmen should bathe each day after work and change to uncontaminated clothing.

2. To reduce absorption through the respiratory tract, workmen engaged in manufacture or packaging of the chemical or insecticides should be protected by adequate exhaust ventilation. Personnel engaged in application of aerosols in greenhouses and pilots applying insecticides by aircraft should wear full face masks, tested to provide protection from organic vapors, mists and dusts. Personnel engaged in applying insecticides out of doors should avoid repeated or excessive exposure to dust, mist or vapor. Those applying insecticides containing parathion should wear respirators equipped with cartridges and filters of the type tested in the United States Department of Agriculture and found to give high degree protection. Wind dispersal of insecticides to unprotected personnel or domestic animals should be avoided.

3. To reduce absorption through the gastrointestinal tract, personnel should remove protective clothing and wash hands, arms and face thoroughly with soap and water before eating, drinking or smoking. Insecticides containing parathion may persist for varying periods as residues on plant tissue. Such residue may present some hazard to those who handle or use agricultural products or work in treated areas. Recommendations for use of parathion insecticides include precautions with reference to harvest and the like, which should be observed for safety of all concerned. Alkyl phosphorus insecticides should not be used or stored where they may contaminate foodstuffs.

4. Inflammable containers of phosphorus insecticides should be promptly burned after emptying. After decontamination by washing (with alkali if practicable), metal and similar containers should be perforated to prevent reuse. Solutions which are spilled should be absorbed on sawdust or clay and burned or buried. Spilled dust may be picked up with a vacuum cleaner and then buried. Working areas that become contaminated with parathion should be washed thoroughly with alkali and the spillage disposed of by burning or burying; if contaminated with TEPP or HETP, they should be flushed thoroughly with water.

5. An additional procedure which helps to prevent cumulative effects in personnel who are frequently exposed to organic phosphorus insecticides is the periodic determination of the cholinesterase of plasma and red blood cells. Persons manifesting reduced cholinesterase activity should be removed from all exposure until this has returned to normal.

CLINICAL EXPERIENCE

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Exposure to organic phosphorus chemicals in their production or use as insecticides has caused several deaths and moderate to severe acute poisonings in a comparatively large number of persons during the short history of their use. These accidents have not been out of proportion to earlier experiences with more familiar and highly toxic agricultural chemicals such as nicotine and cyanide; however, they have occurred with sufficient frequency to warrant the utmost caution on the part of all persons who may be exposed to them. Up to the present time 198 cases of poisoning have been reported (table). This number undoubtedly does not include all of the accidents which have occurred.

Among the foregoing tabulated cases of poisoning, those which have resulted in fatalities are of primary concern. Summary dicussions of the circumstances of poisoning in these cases are presented.

Reported Cases of Poisoning Due to Organic Phosphorus Insecticides

	HETP				TEPP				Parathion			
	Moderate	Severe	Fatal	Total	Moderate	Severe	Fatal	Total	Moderate	Severe	Fatal	Total
Agricultural												
Field worker	2	1	..	3	6	1	..	7	55	18	2	75
Exterminator	..	..	..	..	2	..	..	2	..	2	..	2
Entomologist	1	..	..	1	..	..	..	..	3	1	1	5
Airplane pilot	1	..	..	1	7	..	..	7	1	1	..	2
Fruit picker	..	..	..	..	..	..	..	..	22	..	..	22
Nurseryman	1	..	..	1	1	..	..	1	3	3	..	6
Total	..	..	..	6	..	..	..	17	..	..	..	112
Industrial												
Chemist	..	..	..	..	..	..	..	..	1	..	1	2
Formulator	..	..	..	..	..	..	..	..	5	3	1	9
Packager	..	..	..	..	..	..	..	..	15	6	..	21
Maintenance	..	..	..	..	..	..	..	..	1	2	..	3
Food processing	..	..	..	..	..	..	..	..	1	..	..	1
Other	..	..	..	..	3	..	..	3	14	4	2	20
Total	..	..	..	..	..	..	..	3	..	..	..	56
Miscellaneous												
Child	..	..	..	..	..	1	1	2	..	..	..	..
Adult	..	..	..	..	2	..	..	2	..	..	..	..
Total	..	..	..	..	..	..	..	4	..	..	..	..
Grand total												198

REPORT OF CASES

CASE 1.—A farmer, aged 38, sprayed a tobacco field with a parathion solution. He was not literate and apparently was not aware of the dangerous nature of the chemical. All precautions were ignored. The victim smoked during spraying operations, used discharge nozzles that were at times only a foot or two from his face and allowed himself to become thoroughly wet with the spray. Death occurred 15 hours after the onset of symptoms and was apparently caused by heavy exposure to concentrated parathion powder and prolonged heavy skin and respiratory exposure during spraying operations.

CASE 2.—A 31 year old man, employed as an entomologist by a university agricultural experimental station, had worked intermittently with parathion and other phosphate esters for four months. On the day of the fatal exposure, he operated a spraying machine without benefit of a mask or protective clothing. The day was very warm (98 F.) with little or no wind. During the afternoon he complained of a headache but continued to work until 4:00 p. m., when he felt nausea and vomited. Shortly thereafter he left for home but died before medical assistance could be rendered. There appears to have been significant skin and respiratory exposure due to spray drift, blowing about of

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dust concentrate during the filling of the spray tank and possible vapor inhalation.

CASE 3.—A 26 year old man was a member of a spray crew applying a parathion solution to a citrus orchard. His duties consisted of filling the supply tanks of three orchard sprayers. This operation was performed for a period of five days in two successive weeks, after which the man became seriously ill and was hospitalized. Approximately one month later this man resumed the same work. He immersed his hands and arms in the spray tank solution, smoked while working and discontinued use of a dust respirator because he felt better when not wearing it. On the second day, which was unusually warm (100 F.) and without a breeze, this man became ill in the middle of the morning. He was immediately taken to a hospital and treated, but he died six hours later. Death was attributed to combined skin and respiratory exposure to overwhelming amounts of concentrated dust and diluted parathion spray solution.

CASE 4.—A plant foreman and a fellow workman were splashed by technical parathion liquid from a blow pot. The foreman insisted that his fellow worker immediately bathe and change clothes, but he neglected to do so himself. Approximately eight hours after exposure he became acutely ill, although medical attention was not sought for another eight hours. The patient died 21 hours after the accident as the result of percutaneous absorption of a large amount of technical parathion.

CASE 5.—(This case was reported by Grob and his co-worker.[1]) A 35 year old male was employed for four months as a mixer of liquid parathion and clay dust in a formulating plant. He wore a respirator and complete protective clothing, although his arms and neck were not fully covered. The day of the fatal illness was hot and humid, and the concentration of the parathion in the mixture was increased to slightly below the maximum absorptive capacity of the clay under standard conditions. The victim became acutely ill after five hours of work and died 10 hours later. Poisoning appears to have been due to the inhalation of significant amounts of vapor, with skin absorption by exposed portions of the body as a contributing factor.

CASE 6.—A chemical engineer was employed for one month by a chemical manufacturer synthesizing parathion in a pilot plant operation. Two weeks before his death, the victim complained of symptoms suggestive of parathion poisoning. On the day of the fatal illness, he supervised changing of kettles but became ill in the afternoon and was taken to a hospital.

Death occurred eight hours after the last possible exposure to parathion. The route of absorption was not clearly established. The victim wore neoprene gloves, which are considered inferior to latex gloves because of greater permeability. The amount of parathion vapor which may have been inhaled is unknown.

CASE 7.—A seventh parathion fatality involving a German biologist was reported by Martin.[2] No details are available other than the statement that the victim endeavored to estimate human tolerance for parathion through self experimentation.

CASE 8.—A child, aged 10, found a whiskey bottle in the crotch of a tree and drank from it. He immediately started foaming at the mouth, and his companion called the child's parents. The child died in about 15 minutes, before medical assistance could be obtained. Analysis of the contents of the whiskey bottle indicated the presence of tetraethyl pyrophosphate, although a confirmatory test on the stomach contents could not be made because of the rapid hydrolysis of the chemical.

UNVERIFIED CASES

Two additional fatalities from accidental or intentional ingestion of TEPP and one additional fatality from parathion have been reported. Present information precludes their inclusion in the tabulation because available evidence is more suggestive than confirmatory.

1. Grob and others: Ann. Int. Med. **31**: 899 (Nov.) 1949.
2. Martin: Mfg. Chem. **20**: 163 (April) 1949.

EFFECTS ON BENEFICIAL FORMS OF LIFE, CROPS AND SOIL AND RESIDUE HAZARDS

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The extreme toxicity of organic phosphorus insecticides suggests that they can be harmful to beneficial forms of life, including pollinating insects, certain parasitic and predatory insects, fish and wild life. Their use on livestock and pets is not recommended. With the exception of direct application to domestic animals, little hazard exists with HETP and TEPP because of the lack of residual properties. Since parathion possesses this characteristic, it should not be used at blossom time, because of the danger to pollinating insects, or used in excessive quantities around fish ponds, along streams and in wildlife habitats. Evidence of the possibility of injury from parathion fumes to birds and other wildlife entering recently sprayed areas is inconclusive at the present time.

With the exception of certain varieties of chrysanthemums, plants tolerate recommended concentrations of HETP and TEPP. On the other hand, parathion has been found injurious to a number of fruits (certain varieties of apples, pears) and vegetables (young cucumbers, squash plants and tomatoes) and to dormant plants generally. The use of solvent emulsions of parathion and the presence of sulfur and selenium predispose to this phytotoxicity. Toxicity from soil deposits of HETP and TEPP is not cumulative, because they are rapidly hydrolyzed by moisture. Parathion is also readily hydrolyzed in the presence of soil moisture, but at a rate slower than that for pyrophosphates. It becomes a health hazard when used on turf.

The problem of insecticidal residues is concerned with the continued ingestion of small amounts of pesticidal contaminants of food and the consequent development of chronic toxic effects. Since HETP and TEPP are readily hydrolyzed in the presence of water, the residue problem from these sources is minimal. Parathion's physical characteristics make it a greater hazard.

Life-time feeding studies in rats at low dietary levels of parathion indicate no detectable cumulative effects below 25 parts per million. Animals fed levels above 25 parts per million and up to 100 parts per million, although they survived, displayed symptoms of nervous system poisoning and possessed an inhibition of blood cholinesterase in proportion to the increase of parathion over 25 parts per million in the diet. From this and other data, and allowing for a factor of safety to compensate for a possible greater human susceptibility, a safe residue level on any one item of the diet would be approximately 2 parts per million of parathion. Thus, in the case of apples and pears, for example, if parathion is applied strictly in accordance with the recommendations of the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture, with particular reference to the time between the last spraying and the harvesting of the fruit, normal weathering should result in parathion residues no greater than a fraction of a part per million. Traces of this magnitude would not constitute a health problem. This is not necessarily true in the case of citrus fruit where the peel itself may constitute food. There is evidence that with the lowest spray concentrations effective in the control of insects and mites on citrus fruits, parathion spray residue on the peel may be as high as 2 or 3 parts per million (calculated on the peel basis), this being equivalent to about 0.16 of a part per million based on the whole fruit. The grower, of course, usually has no way of knowing whether or not the peel will ultimately be used for food, and the evaluation of the health hazard resulting from residues such as this is being made at a hearing now in progress.* If spray schedules recommended by qualified entomologists are followed, it is quite unlikely that a parathion spray residue problem will become serious.

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* Federal Register, Sept. 17, 1949; 14 F.R. 5724.

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA

FIFTIETH ANNUAL REPORT ON MEDICAL EDUCATION IN THE UNITED STATES AND CANADA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Donald G. Anderson, M.D., and Anne Tipner

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Introduction

This report, which covers the academic year, July 1, 1949 to June 30, 1950, is the fiftieth annual presentation of information and statistics on medical education in the United States and Canada compiled by the Council on Medical Education and Hospitals of the American Medical Association.

In addition to reporting the customary statistics concerning medical schools, students and graduates, several subjects of current interest and importance are discussed. These include the effect of the national emergency on medical education, a review of major developments in the medical schools during the past year and the survey of medical education. Statistics and information are also presented on the number of unfilled faculty positions reported by the medical schools, the minimum and average cost to medical students of attending medical school, the plans of medical students for future practice, the establishment of preceptorships with practicing physicians, the sponsorship of internships and residencies for prospective general practitioners by medical schools, the financial support of medical education, and plans for the establishment of new medical schools.

As in previous years, the report includes a summary of the postgraduate and continuation courses offered in the United States during the last year.

The list of hospitals approved by the Council for internships, residencies and fellowships was published in the Internship and Residency Number of THE JOURNAL (April 15, 1950). Hospitals that have been approved since the publication of that number are listed in this issue. As announced in the Internship and Residency Number, hospitals approved for residency training in radiology have been reappraised and a revised list of approved residencies is published in this issue on pages 136 to 140.

The current requirements of the various American boards have been summarized. Several of the examining boards have revised their requirements since the 1949 Educational Number was published.

The data published in the Educational Number are obtained from official reports. The Council and THE JOURNAL express their appreciation to the officers of the medical schools, hospitals and other institutions and agencies whose cordial and valuable cooperation makes possible the compilation and presentation of this body of fundamental information which is consulted each year by many individuals, organizations and governmental agencies interested in medical education in the United States and Canada.

Medical Education and the Current Emergency

At the time this report was written, late in August, it was not possible to forecast the impact of the United Nations' police action in Korea on medical education in the United States. The extent to which this emergency will dislocate the normal course of medical education will necessarily be governed by the seriousness and duration of the international crisis. These are factors that cannot be properly evaluated at present. It is also recognized that national policies with respect to the mobilization and utilization of manpower that are still to be established will also bear directly on the conduct of medical education.

The problem of formulating a sound program for medical education in the event of another war has been under study by the Association of American Medical Colleges and the Council on Medical Education and Hospitals since the end of World War II. This study has been based on an intensive, critical analysis of the experience of medical schools and hospitals during World War II. Two days after the invasion of South Korea, the Executive Council of the Association of

American Medical Colleges and the Council on Medical Education and Hospitals formed a Joint Committee on Medical Education in Time of National Emergency to represent both organizations in discussions with representatives of government agencies and other groups on all problems that will relate to medical education during the current crisis. This committee has been engaged since June in drafting for submission at an early date to the appropriate government agencies recommendations with respect to the conduct of medical education, including premedical and graduate medical education. The members of this committee are Dr. Stockton Kimball, Chairman, Dr. Joseph C. Hinsey, Dr. A. C. Bachmeyer, Dr. Dean F. Smiley, Dr. Robert Hall, Dr. George Berry, Dr. B. R. Kirklin, Dr. Harold S. Diehl, Dr. Herman G. Weiskotten, Dr. Harvey B. Stone, Dr. Victor Johnson and Dr. Donald G. Anderson, Secretary. The committee is receiving valuable assistance from consultants appointed by the Armed Forces, the National Security Resources Board, the Selective Service System, the Public Health Service and the Veterans Administration. The committee is also maintaining a close liaison with other professional organizations concerned with the same or similar problems.

It is too early to determine whether drastic changes in premedical education, the organization of the medical curriculum and the training of interns and residents comparable to those put into force during World War II will be sought or whether attempts will be made to place physically qualified medical students on an active duty status in the armed forces.

It does seem clear that without further delay medical schools will want to review their curriculums to determine how increased emphasis can appropriately be placed on such subjects as military medicine, public health and civilian emergency relief, including the prevention and treatment of casualties from atomic explosions.

Planning for the dispersal and evacuation of medical schools in the event of bombing of American cities is another topic to which the medical schools will undoubtedly address themselves in the months ahead.

Whatever plans are adopted for the conduct of medical education in the present emergency, it is earnestly to be hoped that they will be based on full recognition of the fact that a continuing supply of well trained physicians is essential to an effective effort by both the armed forces and the civilian population in time of war or other national emergency. It is also to be hoped that those who formulate the plans will make profitable use of the experiences, both favorable and unfavorable, with the programs in effect during World War II.

At the time this report was prepared, the following policies with respect to personnel had been adopted by the Selective Service System and the Armed Forces.

SELECTIVE SERVICE SYSTEM

1. *Medical Students.*—Under the provisions of Local Board Memorandum No. 7, issued on Nov. 2, 1948 by National Headquarters of the Selective Service System, medical schools may issue certificates to National Headquarters on Form 103 which identify registrants with the Selective Service System who are bona fide medical students in good standing. These forms are forwarded by National Headquarters of the Selective Service System to the local boards. While the responsibility for classification of registrants rests by act of Congress on the local boards, the local boards have been instructed to consider Form 103 as evidence in support of a student's claim for occupational classification (Class II-A).

2. *Premedical Students.*—Under the provisions of Local Board Memorandum No. 7, medical schools may issue certificates on Form 103 for registrants whom they have definitely accepted for admission. These certificates are handled in the same way as certificates issued for medical students.

Under the provisions of this same memorandum, medical schools may also use Form 103 to certify a limited number of college students who, although they have not completed their premedical education, have been provisionally accepted for admission to medical school. It is not thought necessary for medical schools at this time to follow this procedure in order to insure an adequate flow of premedical students. In August 1950 National Headquarters of the Selective Service System in a bulletin to the local boards advised that in the case of college students, local boards may consider the following conditions when all three exist in the case of a registrant as warranting consideration for occupational deferment:

1. The registrant has completed at least one academic year of a full time course of instruction at a college, university or similar institution of learning.

2. The college or university at which the registrant last completed an academic year of a full time course of instruction certifies that the registrant's scholastic standing placed him among the upper half of his class.

3. The local board is satisfied by the record of the registrant's actions in making normally required arrangements that he had fully intended prior to August 1, 1950, to enroll in a full time course of instruction at a college, university or similar institution of learning for the academic year ending in the spring of 1951.

Local Board Memorandum No. 7 or this bulletin should, for the present, at least, make it possible for all acceptable, qualified premedical students to continue their college education. It must be borne in mind that it will be necessary that the premedical student and the college he is attending fully advise the local board that he meets the required criteria listed above. It is further understood that National Headquarters of the Selective Service System has under consideration the issuance of a new general policy which will provide for the continued training of students in all areas from which an adequate supply of professional students may be obtained. It is thus clear that under the present thinking, the Selective Service System intends to make adequate provision for a continuing supply of well qualified students, so that the production of physicians during the current national emergency will not be interrupted or curtailed.

3. *Interns.*—This paragraph refers only to the first 12 months of internship. No policy with respect to interns has been announced by National Headquarters of the Selective Service System. As the single year of internship is a requirement of doctors of medicine for licensure in many states and for active duty in the Medical Corps of the Armed Forces, it is believed that the Selective Service local boards will give consideration for an occupational classification under the general provisions of the Selective Service Act and under Selective Service Regulations 1622.9 and 1622.10. These regulations, based on the Act, provide for such

a classification when a person is engaged in an activity or in study, research or medical, scientific or other endeavors found to be necessary to the maintenance of the national health, safety or interest.

4. *Residents and Second Year Interns.*—No policy has been issued by National Headquarters of the Selective Service System with respect to residents and second year interns. These men or their employers may apply for occupational classification on the same basis as the first year interns. Determination of whether such a classification shall be made will rest with each local board.

5. *Faculty Members.*—At the present time the Selective Service Act applies only to persons between the ages of 19 and 25, inclusive. It is doubtful if many faculty members fall in this age group. Should the age limits for registration under the Selective Service Act be extended, it is expected that essential faculty members or their employers should request an occupational classification on the same basis as residents and second year interns.

Should any of the persons referred to in the foregoing paragraphs be classified by his local board in a class available for military service, the registrant himself, or the college to which he has been admitted or in which he is enrolled, or his medical school or hospital employer, if either has requested a deferment for the registrant, has the right of appeal if this appeal is filed within a period of ten days from the mailing of the classification notice. Should the appeal board sustain the classification of the registrant in a class available for military service, the registrant or the employer (college, medical school or hospital) may appeal this decision to the President, if there is a dissenting vote in the appeal board. If there is no dissenting vote, the State Director or the National Director may, on representation, take an appeal to the President.

If legislation is passed which extends the age for registration under the Selective Service Act or which provides for the registration and induction into service of certain technical and specialist personnel, including physicians, it would seem probable that some agency comparable to the Procurement and Assignment Service of World War II will be established to assist local boards in identifying those residents and faculty members who are essential personnel and who should be given an occupational classification.

Armed Forces

At the present time a considerable number of premedical students, medical students, interns, residents and faculty are members of the reserve forces of the Army, Navy, Air Force and Marine Corps or of National Guard units. Those who are graduate physicians for the most part hold commissions in the medical departments of these services, although a few may have retained commissions in other departments. Among premedical and medical students, however, a large number are enrolled as reserves in branches other than the medical departments.

On Aug. 1, 1950, the Secretary of Defense announced a policy on delay in call to active duty for members of all civilian components of the Armed Forces possessing critical occupational skills. This statement called attention to the fact that it is a basic function of the civilian components of the Armed Forces to be available for military service in time of an emergency in keeping with the traditional policy of our nation to have a relatively small military force in being, supported by reserves and the National Guard. It is recognized, however, that in an emergency, the national interest may dictate that the ordering to active duty of some reservists be delayed temporarily. The statement goes on to establish the basic criteria on which requests for delay in call to active duty will be considered and evaluated. Under these criteria, provision is made for delays in call-up of premedical students who have been definitely accepted for admission to medical schools, medical students, interns and essential residents and faculty members who are in the reserves. The statement makes clear, however, that delays in call to active duty will be made only on an individual basis and that they shall not be considered as a means of exempting persons indefinitely from military service.

Each of the military departments is responsible for implementing these policies with respect to its own reserves and is issuing its own regulations. These regulations are being reported from time to time in THE JOURNAL. All the services have emphasized that requests for delay in call-up should not be submitted until orders to report for active duty have actually been received. While each of the military departments has established an appeal board at the secretarial level which will reconsider individual cases in which the individual or his employer has additional facts or adequate reason to believe that an error was made by the first board, it is emphasized that unless delay in call-up orders are received prior to the reporting date, the person concerned must comply with his original orders.

Survey of Medical Education

The survey of medical education that is being conducted by the Committee for the Survey of Medical Education under the sponsorship of the Council and the Association of American Medical Colleges will enter its second year this fall. Twenty-four medical schools were visited during the first year. It is hoped that the national emergency will not prevent continuance of this project. While the survey was designed primarily to study medical education under peacetime conditions, important lessons may be learned from observing modifications necessitated by the national emergency. Likewise, the survey's findings should provide information that will be of value to those concerned with establishing policies for medical education in the present emergency. Even if the international situation should become more serious, there would be a definite place for the survey in preparation for the rehabilitation of medical education in the postemergency period. It is worth recalling that the Goodenough Report which has served as a guide for many of the most significant developments in medical education in Great Britain during the past five years was prepared and published during World War II.

During the past year an Advisory Council composed of leading citizens from many fields was created to review the program for the survey and to advise the committee as to whether the survey is developing the kind of information that the members of the Advisory Council believe to be needed and whether the methods used in carrying out the survey and in presenting its findings are the most effective that can be employed. The members of the Advisory Council are Dr. Raymond B. Allen, Dr. Donald B. Armstrong, Dr. Detlev W. Bronk, Mr. George Bugbee, Mr. William B. Given Jr., Mr. Clinton S. Golden, General Paul R. Hawley,

TABLE 1.—*Approved Medical Schools in the United States*

	Name and Location of School	1951 Premedical Requirement by Years	Students by Classes, 1949-1950						Graduates July 1, 1949 to June 30, 1950	Executive Officer	
			Freshman	Sophomore	Junior	Senior	Required Intern Year	Totals†			
	ALABAMA										
1	Medical College of Alabama, Birmingham	3	56	51	52	51	..	210	51	Tinsley R. Harrison, M.D., Acting Dean	1
	ARKANSAS										
2	University of Arkansas School of Medicine, Little Rock	3	93	78	83	69	..	323	69	Hayden C. Nicholson, M.D., Dean	2
	CALIFORNIA										
3	University of California School of Medicine, San Francisco	3	72	72	72	75	..	291	75	Francis Scott Smyth, M.D., Dean	3
4	College of Medical Evangelists, Loma Linda-Los Angeles	4	97	99	82	81	74	359	73	Harold Shryock, M.D., Dean, Loma Linda; Wm. F. Norwood, Ph.D., Dean, Los Angeles	4
5	University of Southern California School of Medicine, Los Angeles	3	69	66	65	67	60	267	60	Burrell O. Raulston, M.D., Dean	5
6	Stanford University School of Medicine, Stanford University-San Francisco	3	63	62	57	58	60	240	60	Loren R. Chandler, M.D., Dean	6
	COLORADO										
7	University of Colorado School of Medicine, Denver	3	77	60	73	67	..	277	67	Robert C. Lewis, Ph.D., Dean	7
	CONNECTICUT										
8	Yale University School of Medicine, New Haven	3	65	71	63	49	..	248	45	C. N. Hugh Long, M.D., Dean	8
	DISTRICT OF COLUMBIA										
9	Georgetown University School of Medicine, Washington	Degree*	120	107	105	82	..	414	82	Rev. Paul A. McNally, S.J., Ph.D., Dean	9
10	George Washington University School of Medicine, Washington	3	94	84	77	78	..	333	78	Walter A. Bloedorn, M.D., Dean	10
11	Howard University College of Medicine, Washington	2	76	71	69	65	..	281	62	Joseph L. Johnson, M.D., Dean	11
	GEORGIA										
12	Medical College of Georgia, Augusta	3	79	79	74	79	..	311	79	G. Lombard Kelly, M.D., President	12
13	Emory University School of Medicine, Emory University	3	73	70	68	55	..	266	55	R. Hugh Wood, M.D., Dean	13
	ILLINOIS										
14	Chicago Medical School	Degree	72	65	63	57	41	257	44	John J. Sheinin, M.D., President	14
15	Northwestern University Medical School, Chicago	3	131	125	132	140	134	526	131	Richard H. Young, M.D., Dean	15
16	Stritch School of Medicine of Loyola University, Chicago	3	90	85	79	69	..	323	68	John F. Sheehan, M.D., Acting Dean	16
17	University of Chicago, The School of Medicine	3	72	65	60	57	..	254	57	Lowell T. Coggeshall, M.D., Dean, Division of Biological Sciences; A. C. Bachmeyer, M.D., Assoc. Dean; F. J. Mullin, Ph.D., Dean of Students	17
18	University of Illinois College of Medicine, Chicago	3	169	164	162	161	..	656	161	Stanley W. Olson, M.D., Dean	18
	INDIANA										
19	Indiana University School of Medicine, Bloomington-Indianapolis	3	150	143	106	93	..	492	96	John D. Van Nuys, M.D., Dean, Bloomington	19
	IOWA										
20	State University of Iowa College of Medicine, Iowa City	3	100	81	88	69	..	338	70	Willis Marion Fowler, M.D., Chairman, Executive Committee	20
	KANSAS										
21	University of Kansas School of Medicine, Lawrence-Kansas City	3 and Degree	100	79	86	83	..	348	83	Franklin D. Murphy, M.D., Dean	21
	KENTUCKY										
22	University of Louisville School of Medicine, Louisville	3	96	88	92	91	..	367	90	J. Murray Kinsman, M.D., Dean	22
	LOUISIANA										
23	Louisiana State University School of Medicine, New Orleans	3	125	101	97	68	..	391	68	William W. Frye, M.D., Dean	23
24	Tulane University of Louisiana School of Medicine, New Orleans	3	129	121	135	120	..	505	118	Maxwell E. Lapham, M.D., Dean	24
	MARYLAND										
25	Johns Hopkins University School of Medicine, Baltimore	Degree	78	70	75	73	..	296	71	Alan M. Chesney, M.D., Dean	25
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	3	98	89	95	80	..	362	80	H. Boyd Wylie, M.D., Dean	26
	MASSACHUSETTS										
27	Boston University School of Medicine, Boston	3	74	68	58	56	..	256	53	James M. Faulkner, M.D., Dean	27
28	Harvard Medical School, Boston	3	111	111	146	132	..	500	133	George Packer Berry, M.D., Dean	28
29	Tufts College Medical School, Boston	Degree	112	99	96	96	..	403	102	Dwight O'Hara, M.D., Dean	29
	MICHIGAN										
30	University of Michigan Medical School, Ann Arbor	3	151	132	115	95	..	493	92	A. C. Furstenberg, M.D., Dean	30
31	Wayne University College of Medicine, Detroit	3	68	66	63	58	..	255	58	Gordon H. Scott, Ph.D., Dean	31
	MINNESOTA										
32	University of Minnesota Medical School, Minneapolis	3	124	121	118	95	85	468	87	Harold S. Diehl, M.D., Dean of Medical Sciences	32

	MISSOURI										
33	**St. Louis University School of Medicine, St. Louis**	4	122	119	111	104	..	456	103	Melvin A. Casberg, M.D., Dean	33
34	**Washington University School of Medicine, St. Louis**	3	87	80	104	85	..	356	85	Robert A. Moore, M.D., Dean	34
	NEBRASKA										
35	**Creighton University School of Medicine, Omaha**	3	76	70	73	64	..	283	63	Percy J. Carroll, M.D., Dean	35
36	**University of Nebraska College of Medicine, Omaha**	3	88	86	84	76	..	334	76	Harold C. Lueth, M.D., Dean	36
	NEW YORK										
37	**Albany Medical College, Albany**	3	54	43	40	52	..	189	52	Robert S. Cunningham, M.D., Dean	37
38	**State University of New York, State University Medical Center at New York City, College of Medicine, Brooklyn**	3	150	102	97	93	..	442	92	Jean A. Curran, M.D., President Duncan W. Clark, M.D., Dean	38
39	**University of Buffalo School of Medicine, Buffalo**	3	75	66	64	74	..	279	72	Stockton Kimball, M.D., Dean	39
40	**Columbia University College of Physicians and Surgeons, New York**	3	120	108	110	104	..	442	104	Willard C. Rappleye, M.D., Dean	40
41	**Cornell University Medical College, New York**	3 and Degree	84	80	84	78	..	326	78	Joseph C. Hinsey, Ph.D., Dean	41
42	**New York Medical College, Flower and Fifth Avenue Hospitals, New York**	Degree	124	122	122	98	..	466	98	J. A. W. Hetrick, M.D., Dean, President	42
43	**New York University College of Medicine, New York**	3	125	128	127	121	..	501	118	Currier McEwen, M.D., Dean	43
44	**University of Rochester School of Medicine and Dentistry, Rochester**	3	69	69	66	67	..	271	67	George H. Whipple, M.D., Dean	44
45	**State University of New York, Medical Center at Syracuse University, School of Medicine, Syracuse**	3	76	47	48	38	..	209	38	Herman G. Weiskotten, M.D., Dean	45
	NORTH CAROLINA										
46	**Duke University School of Medicine, Durham**	3	76	75	76	70	..	297	72	Wilburt C. Davison, M.D., Dean	46
47	**Bowman Gray School of Medicine of Wake Forest College, Winston-Salem**	3	57	52	61	41	..	211	41	C. C. Carpenter, M.D., Dean	47
	OHIO										
48	**University of Cincinnati College of Medicine, Cincinnati**	3	90	87	82	78	..	337	76	Stanley Dorst, M.D., Dean	48
49	**Western Reserve University School of Medicine, Cleveland**	3	80	80	81	91	..	332	91	Joseph T. Wearn, M.D., Dean	49
50	**Ohio State University College of Medicine, Columbus**	3	89	85	75	69	..	318	68	Charles A. Doan, M.D., Dean	50
	OKLAHOMA										
51	**University of Oklahoma School of Medicine, Oklahoma City**	3	80	58	64	75	..	277	74	Mark R. Everett, Ph.D., Dean	51
	OREGON										
52	**University of Oregon Medical School, Portland**	3	76	70	71	57	..	274	58	D. W. E. Baird, M.D., Dean	52
	PENNSYLVANIA										
53	**Hahnemann Medical College and Hospital of Philadelphia**	3	105	88	76	73	..	342	72	Charles L. Brown, M.D., Dean	53
54	**Jefferson Medical College of Philadelphia**	3	166	156	160	154	..	636	152	William Harvey Perkins, M.D., Dean	54
55	**Temple University School of Medicine, Philadelphia**	3	131	129	118	102	..	480	100	William N. Parkinson, M.D., Dean	55
56	**University of Pennsylvania School of Medicine, Philadelphia**	3	126	116	128	117	..	487	114	John McK. Mitchell, M.D., Dean	56
57	**Woman's Medical College of Pennsylvania, Philadelphia**	3	50	50	42	34	..	176	34	Marion Fay, Ph.D., Dean	57
58	**University of Pittsburgh School of Medicine, Pittsburgh**	3	100	83	80	71	..	334	70	William S. McElroy, M.D., Dean	58
	SOUTH CAROLINA										
59	**Medical College of the State of South Carolina, Charleston**	3	60	57	57	57	..	231	57	Kenneth Merrill Lynch, M.D., President; John T. Cuttino, M.D., Acting Dean	59
	TENNESSEE										
60	**University of Tennessee College of Medicine, Memphis**	2	145	137	152	144	..	578	143	O. W. Hyman, Ph.D., Dean	60
61	**Meharry Medical College, Nashville**	2	65	62	57	61	..	245	60	Murray C. Brown, M.D., Director of Medical Education; Michael J. Bent, M.D., Dean	61
62	**Vanderbilt University School of Medicine, Nashville**	Degree	52	50	54	49	..	205	48	John B. Youmans, M.D., Dean	62
	TEXAS										
63	**Southwestern Medical School of the University of Texas, Dallas**	3	100	63	62	56	..	281	56	Carl A. Moyer, M.D., Dean	63
64	**University of Texas School of Medicine, Galveston**	3	164	94	97	97	..	452	93	Chauncey D. Leake, Ph.D., Vice Pres.; D. Bailey Calvin, Ph.D., Dean of Students and Curricular Affairs	64
65	**Baylor University College of Medicine, Houston**	3	93	81	80	73	..	327	73	Walter H. Moursund, M.D., Dean	65
	UTAH										
66	**University of Utah School of Medicine, Salt Lake City**	3	52	50	50	48	..	200	52	H. L. Marshall, M.D., Acting Dean	66
	VERMONT										
67	**University of Vermont College of Medicine, Burlington**	3	45	40	39	38	..	162	36	William Eustis Brown, M.D., Dean	67
	VIRGINIA										
68	**University of Virginia Department of Medicine, Charlottesville**	3	77	64	71	64	..	276	59	Vernon W. Lippard, M.D., Dean	68
69	**Medical College of Virginia, Richmond**	3	84	74	104	92	..	354	92	Harvey B. Haag, M.D., Dean; George W. Bakeman, B.S., Asso. Dean in Charge of Admissions	69
	WASHINGTON										
70	**University of Washington School of Medicine, Seattle**	3	75	43	49	44	..	211	44	Edward L. Turner, M.D., Dean	70
	WISCONSIN										
71	**University of Wisconsin Medical School, Madison**	3	85	73	72	76	..	306	73	William S. Middleton, M.D., Dean	71
72	**Marquette University School of Medicine, Milwaukee**	3	102	93	85	84	..	364	84	John S. Hirschboeck, M.D., Dean	72
	Totals	..	6,759	6,071	6,079	5,638	454	24,547	5,553		

* 90 semester hours for veterans.
† Intern enrolment not included in total column.

Mr. J. S. Jones, Honorable Lister Hill, Mr. Stanley Resor, Mr. Edward L. Ryerson, Dr. Leonard A. Scheele, Mr. Harold E. Stassen and Mr. Robert L. Stearns.

The W. K. Kellogg Foundation has made a grant of $75,000 to assist the committee in its study of graduate and postgraduate medical education. This grant is being used to secure additional members of the committee's staff who will concentrate on evaluating the basic features of internship and residency training and of postgraduate instruction for the practicing physician.

Another development of importance has been the appointment of a Subcommittee on Preprofessional Education. In coordination with the program of the Survey Committee, this group will undertake an intensive study of the education of premedical students in the colleges and universities of the country. The Subcommittee is under the chairmanship of Dr. Aura E. Severinghaus, Associate Dean, Columbia University College of Physicians and Surgeons. The other members of the subcommittee are Dr. George Packer Berry, Dr. Harry J. Carman, Dr. Merle C. Coulter, Dr. Alan Willard Brown, Dr. William E. Cadbury Jr., Dr. Theodore M. Greene, Dr. Frank R. Kille, Dr. Franklin Murphy and Dr. John Romano. The work of the subcommittee is being financed by a grant of $65,000 from the John R. and Mary Markle Foundation.

TABLE 2.—*Approved Medical Schools in Canada*

	Name and Location of School	1951 Premedical Requirement by Years	Students by Classes, 1949-1950: First Premedical Year	Second Premedical Year	Freshman	Sophomore	Junior	Senior	Additional Year	Required Intern Year	Totals*	Graduates July 1, 1949 to June 30, 1950	Executive Officer	
	ALBERTA													
1	University of Alberta Faculty of Medicine, Edmonton	3	..	..	59	50	57	43	..	..	209	41	John W. Scott, M.D., Dean	1
	MANITOBA													
2	University of Manitoba Faculty of Medicine, Winnipeg	3	..	..	73	66	88	67	..	65	294	63	L. G. Bell, M.D., Dean	2
	NOVA SCOTIA													
3	Dalhousie University Faculty of Medicine, Halifax	2	..	..	58	58	54	56	..	45	226	45	H. G. Grant, M.D., Dean	3
	ONTARIO													
4	Queen's University Faculty of Medicine, Kingston	1	64	..	56	61	54	51	50	..	336	47	G. H. Ettinger, M.D., Dean	4
5	University of Western Ontario Faculty of Medicine, London	3	..	..	60	59	59	95	..	..	273	96	J. B. Collip, M.D., Dean	5
6	University of Toronto Faculty of Medicine, Toronto	2	147	146	165	171	175	160	..	..	964	161	J. A. McFarlane, M.B., Dean	6
	QUEBEC													
7	McGill University Faculty of Medicine, Montreal	4	..	..	122	103	119	109	..	..	453	113	G. Lyman Duff, M.D., Dean	7
8	University of Montreal Faculty of Medicine, Montreal	1	..	..	129	96	85	95	..	84	398	84	Edmond Dubé, M.D., Dean	8
9	Laval University Faculty of Medicine, Quebec	Degree	..	..	139	105	70	146	119	..	599	144	Charles Vézina, M.D., Dean	9
	Totals		211	146	865	769	761	822	169	194	3,743	791		

* Intern enrolment not included in total column.

TABLE 3.—*Approved Schools of the Basic Medical Sciences in the United States and Canada*

	Name and Location of School	1951 Premedical Requirement by Years	Students by Classes, 1949-1950: Freshman	Sophomore	Total	Executive Officer	
	MISSISSIPPI						
1	University of Mississippi School of Medicine, University	3	a 31	31	62	D. S. Pankratz, M.D., Dean	1
			31	30	61		
	MISSOURI						
2	University of Missouri School of Medicine, Columbia	3	45	46	91	Trawick H. Stubbs, M.D., Dean	2
	NEW HAMPSHIRE						
3	Dartmouth Medical School, Hanover	3 and Degree	24	24	48	Rolf C. Syvertsen, M.D., Dean	3
	NORTH CAROLINA						
4	University of North Carolina School of Medicine, Chapel Hill	3	58	57	115	W. Reece Berryhill, M.D., Dean	4
	NORTH DAKOTA						
5	*University of North Dakota School of Medicine, Grand Forks	3	30	30	60	W. P. Potter, M.D., Dean	5
	SOUTH DAKOTA						
6	University of South Dakota School of Medical Sciences, Vermillion	3	33	26	59	Donald Slaughter, M.D., Dean	6
	WEST VIRGINIA						
7	West Virginia University School of Medicine, Morgantown	3	31	29	60	Edward J. Van Liere, M.D., Dean	7
	CANADA						
8	University of Saskatchewan School of Medical Sciences, Saskatoon	2	32	29	61	W. S. Lindsay, M.B., Dean	8
	Totals	..	315	302	617		

a. Begi[illegible]late of additional freshman class February 1950. * On probation.

Approved Medical Schools

The 72 medical schools in the United States approved by the Council on Medical Education and Hospitals of the American Medical Association are shown in table 1,

the nine Canadian schools in table 2 and the eight approved schools of the basic medical sciences in the United States and Canada in table 3.

Since the publication of the 1949 Educational Number, the University of Washington School of Medicine, Seattle, has been added to the approved list and the

TABLE 4.—*Schools, Students*[1] *and Graduates in Class A and Approved Medical Schools*[2] *in the United States, 1910-1950*

Students in the required intern year are not included.

	Schools	Students	Graduates
1910	66	12,530	3,165
1915	67	11,314	2,629
1920	70	12,550	2,680
1921	70	13,488	2,811
1922	69	14,625	2,304
1923	70	16,454	2,881
1924	70	16,775	3,343
1925	71	17,402	3,842
1926	71	17,887	3,732
1927	73	18,754	3,798
1928	74	19,794	4,091
1929	75	20,843	4,412
1930	76	21,597	4,565
1931	76	21,982	4,735
1932	76	22,135	4,936
1933	77	22,466	4,805
1934	77	22,799	5,035
1935	77	22,888	5,101
1936	77	22,564	5,183
1937	77	22,095	5,377
1938	77	21,587	5,194
1939	77	21,302	5,089
1940	77	21,271	5,097
1941	77	21,379	5,275
1942	77	22,061	5,163
1943	76	22,631	5,223
1944	77	23,529	5,134
1944 (second session)	77	24,606	5,169
1945	77	24,028	5,136
1946 (to May 31)	77	23,216	5,826
1947 *	77	23,900	6,389
1948	77	22,739	5,543
1949	78	23,670	5,094
1950	79	25,103	5,553

* Includes additional classes.

1. Includes figures for schools of the basic medical sciences.

2. Medical schools graded as Class A from 1910-1929; as approved since 1929.

University of South Dakota School of Medical Sciences has been removed from probation.

The University of Washington School of Medicine admitted its first students in the fall of 1946 and graduated its first class in June 1950. In accordance with the established policy of the Council, this school was not eligible for approval until a program of instruction was organized and in operation for all four years of the medical course. When the first senior class was enrolled in this school, in the fall of 1949, the school was inspected and approved by the Council. The approval is retroactive to include all students who have been enrolled since the school was opened, in 1946.

The basic science school of the University of North Dakota remains on probation.

During the period covered by this report, three medical schools formerly privately owned by nonprofit corporations merged with state universities. On Sept. 1, 1949, the Southwestern Medical College became a branch of the University of Texas and changed its name to the Southwestern Medical School of the University of Texas. On April 5, 1950 the Long Island College of Medicine became a part of the State University of New York and changed its name to State University of New York State University Medical Center at New York City College of Medicine. On June 26, 1950 Syracuse University College of Medicine also became a part of the State University of New York and changed its name to State University of New York Medical Center at Syracuse University School of Medicine. With the addition of the University of Washington and the three schools mentioned above to their number, the number of publicly owned schools has increased from 34 to 38. The number of medical schools owned by private nonprofit corporations has been reduced from 44 to 41.

Tables 1, 2 and 3 list the quantitative premedical requirements effective next year for each school, the enrolment by classes for the academic year 1949-1950 and the total attendance exclusive of students in the required intern year. The number of graduates from July 1, 1949 to June 30, 1950 is also given for each school.

For the Canadian schools, enrolments are also given for premedical students in the medical school as well as for students in a fifth medical year and the required intern year.

The name of the dean or executive officer is given for each school. Changes have been made in the executive officers of 10 of the 89 medical and basic science schools in the United States and Canada since the publication of the 1949 Educational Number. The following schools have appointed new executive officers: Alabama, Arkansas, Stritch, Illinois, Iowa, Vanderbilt, Southwestern, Manitoba, Queen's and McGill.

Medical School Calendars

During the academic year 1949-1950 most schools followed conventional schedules, with students entering in September or October and graduating in May or June. No school graduated more than one class during this academic year, although four schools, Northwestern, University of Chicago, Minnesota and Tennessee, graduated students quarterly. Utah graduated a few students on an accelerated program in August 1949. The regular graduation at this school occurred in June 1950.

The freshman year in all schools except Utah and Kansas began either in September or October. These two schools admitted their freshmen classes in June. At Kansas one fifth of the class did not begin work until September under the plan of staggering the peri-

TABLE 5.—*Schools, Students*[1] *and Graduates in Class B and Class C Medical Schools in the United States, 1910-1929*

Students in the required intern year are not included.

	Class B			Class C		
	Schools	Students	Graduates	Schools	Students	Graduates
1910	43	6,944	854	22	2,032	421
1915	22	2,066	686	15	909	219
1920	10	731	162	8	798	205
1921	9	832	200	7	853	180
1922	7	852	142	7	663	182
1923	4	522	82	7	456	156
1924	4	383	115	6	370	104
1925	3	554	118	6	184	14
1926	3	582	130	5	371	100
1927	3	584	117	4	344	120
1928	2	371	96	4	380	75
1929	1	35	34	0	0	0

1. Includes figures for schools of the basic medical sciences.

ods of instruction and vacation during the first year and a half of the medical school course. Tennessee admitted students quarterly. Mississippi admitted two freshman classes, one in September and one in February.

As presently planned, the schedule for classes entering medical school in 1950 will be the same as that for 1949 except that Mississippi will admit classes in July and January. All schools except the four that graduate

students quarterly will hold their graduations in 1951 only in May or June. During the past year all the Canadian schools followed regular schedules and will continue to do so for the coming academic year.

TABLE 6.—*Graduates with Baccalaureate Degrees in Medical Schools in the United States and Canada, July 1, 1949 to June 30, 1950*

	Graduates	Degrees	Per Cent with Degrees
Medical College of Alabama	51	47	92.2
University of Arkansas	60	68	98.6
University of California	75	71	94.7
College of Medical Evangelists	73	50	68.5
University of Southern California	60	29	48.3
Stanford University	60	60	100.0
University of Colorado	67	54	80.6
Yale University (Connecticut)	45	37	82.2
Georgetown University (Dist. of Columbia)	82	58	70.7
George Washington University	78	52	66.7
Howard University	62	43	69.4
Emory University (Georgia)	55	47	85.5
Medical College of Georgia	79	46	58.2
Chicago Medical School (Illinois)	44	20	45.5
Northwestern University	131	90	68.7
Stritch School of Medicine	68	18	26.5
University of Chicago	57	49	86.0
University of Illinois	161	158	98.1
Indiana University	93	84	90.3
State University of Iowa	70	34	48.6
University of Kansas	83	70	95.2
University of Louisville (Kentucky)	90	60	66.7
Louisiana State University	68	39	57.3
Tulane University of Louisiana	118	76	64.4
Johns Hopkins University (Maryland)	71	68	95.8
University of Maryland	80	52	65.0
Boston University (Massachusetts)	53	48	90.6
Harvard Medical School	133	98	73.7
Tufts College Medical School	102	93	91.2
University of Michigan	92	73	79.3
Wayne University	58	35	60.3
University of Minnesota	87	87	100.0
St. Louis University (Missouri)	103	46	44.7
Washington University	85	70	82.4
Creighton University (Nebraska)	63	33	52.3
University of Nebraska	76	53	69.7
Albany Medical College (New York)	53	39	75.0
State University of New York, Brooklyn	93	77	83.7
University of Buffalo	73	25	34.7
Columbia University	104	87	83.7
Cornell University	78	63	80.8
New York Medical College	98	72	73.5
New York University	118	92	78.0
University of Rochester	67	59	88.1
State University of New York, Syracuse	98	26	66.4
Duke University (North Carolina)	72	39	54.2
Bowman Gray School of Medicine	41	36	87.8
University of Cincinnati (Ohio)	76	53	69.7
Western Reserve University	91	76	83.5
Ohio State University	68	53	77.9
University of Oklahoma	74	45	60.8
University of Oregon	58	58	100.0
Hahnemann Med. College (Pennsylvania)	72	51	72.2
Jefferson Medical College	152	100	65.8
Temple University	100	74	74.0
University of Pennsylvania	114	84	73.7
Woman's Medical College	34	33	97.1
University of Pittsburgh	70	52	74.3
Medical College of South Carolina	57	46	82.1
University of Tennessee	143	67	46.9
Meharry Medical College	60	50	83.3
Vanderbilt University	48	47	97.9
Southwestern Medical College (Texas)	56	36	64.3
Baylor University	73	43	58.9
University of Texas	90	53	57.0
University of Utah	52	44	84.6
University of Vermont	36	31	86.1
Medical College of Virginia	92	78	84.8
University of Virginia	59	46	78.0
University of Washington	44	33	75.0
University of Wisconsin	73	73	100.0
Marquette University	84	51	60.7
University of Alberta, Canada	41	39	95.1
University of Manitoba	63	22	34.9
Dalhousie University, Nova Scotia	45	14	31.1
Queen's University, Ontario	47	7	14.9
University of Western Ontario	96	25	26.9
University of Toronto	161	28	17.4
McGill University, Quebec	113	89	78.8
University of Montreal	84	84	100.0
Laval University	144	144	100.0
Totals	6,344	4,569	72.0

Graduates

The last columns of tables 2 and 3 give the number of graduates from each medical school in the United States and Canada respectively from July 1, 1949 to June 30, 1950. During this period 5,553 physicians were graduated from medical schools in the United States. This is the largest class to graduate from approved medical schools in the United States in one year except for the years 1946 and 1947, when several schools graduated more than one class during a 12 month period at the conclusion of the wartime accelerated program.

In table 4 are shown the total number of class A and approved medical schools and the total number of students and graduates for these schools in the United States since 1910. The form of this table has been modified from that used in former years. Previously, in presenting the figures for the years 1910 through 1929, no separation of statistics was made for class A, class B and class C schools. This classification was dropped by the Council after 1929. Since that date medical schools have been classified only as approved or unapproved and statistics have been published only for approved medical schools. In table 5 are shown the statistics for class B and class C schools for the period 1910-1929.

Since the classification of "approved medical school" in use since 1929 is comparable with the older classification of class A medical school, those desiring to compare statistics for approved medical schools with statistics for comparable schools in the earlier period should use the statistics reported for class A schools. It was felt important that the form of this table be revised so that more accurate comparisons could be made of the number of schools, students and graduates over the years than has heretofore been possible. In the revision of this table the original sources of data in the Council's files were used. As a result, it was necessary that a few minor corrections be made in the totals previously reported for the years 1915 through 1924.

The schools with the largest number of graduates during 1949-1950 were Illinois, 161; Jefferson, 152; Tennessee 143; Harvard 133, and Northwestern 131. Eight schools graduated fewer than 50 students. The schools with the smallest number of graduates were: Woman's Medical (34), Vermont (36) and Syracuse (38).

In Canada there were 791 graduates. Toronto had the largest number of graduates, 161. Alberta (41), Dalhousie (45) and Queen's (47) had the fewest graduates.

Of the total of 6,344 graduates in the United States and Canada during 1949-1950, 72 per cent possessed a baccalaureate degree. Last year only 48.3 per cent of the graduates were in this category. The number and percentage of graduates with a baccalaureate degree from each medical school are shown in table 6.

On the basis of enrolments in the senior class for 1950-1951 the medical schools in the United States have estimated that they will have slightly more than 6,000 graduates during the coming year. The Canadian schools estimate that they will graduate somewhat more than 800 physicians.

Enrolments 1949-1950

All records for total enrolment and the number of students admitted to approved medical schools in the United States were broken in the past year. Excluding students taking a required intern year, the total enrolment in the 72 medical and 7 basic science schools in the United States for the year 1949-1950 was 25,103. The figure for the previous year was 23,670. There was thus an increase of 1,433 students, or 6 per cent, in total enrolment. The freshman class for the first time exceeded 7,000 students. The actual number, 7,042,

represented an increase of 354, or 5.3 per cent, over the preceding year and an increase of 1,026, or 17 per cent, over the average size of the freshman class in the 10 years preceding World War II. The enrolment figures for the academic year 1949-1950 for the individual schools are given in tables 1, 2 and 3. The total enrolments by classes in the medical and basic science schools in the United States and Canada are recapitulated in table 7.

The total enrolment in the Canadian schools, including one basic science school, was 3,278, an increase of 45 over the preceding session. In addition, there were 357 premedical and 169 fifth (not intern) year students in the Canadian schools. These students are included in the "total" column of table 2, but not in that of table 7.

TABLE 7.—*Enrolments by Classes in Medical Schools of the United States and Canada, 1949-1950*

Students in the required intern year are not included

	Freshmen	Sophomores	Juniors	Seniors	Total	Total Preceding Session
72 Medical Schools (U. S.)	6,759	6,071	6,079	5,638	24,547	23,146
7 Basic Science Schools (U. S.)	283	273	.....	.....	556	524
Totals (U. S.)	7,042	6,344	6,079	5,638	25,103	23,670
9 Medical Schools (Canada)	865	709	761	822	3,217*	3,170†
1 Basic Science School (Canada)	32	29	.....	.....	61	63
Totals (Canada)	897	798	761	822	3,278	3,233†
Grand Totals (U. S. and Canada)	7,939	7,142	6,840	6,460	28,381	26,903

* Does not include 357 premedical and 169 fifth year students.
† Does not include 352 premedical and 149 fifth year students.

TABLE 8.—*Students in the Required Intern Year in the United States, 1931-1950*

1930-1931	1,025
1931-1932	1,067
1932-1933	1,106
1933-1934	1,183
1934-1935	1,233
1935-1936	1,213
1936-1937	1,235
1937-1938	1,132
1938-1939	1,152
1939-1940	1,152
1940-1941	1,038
1941-1942	767
1942-1943	639
1943-1944	451
1944 (Second Session)	447
1944-1945	452
1945-1946	488
1946-1947*	582
1947-1948	447
1948-1949	458
1949-1950	454

* Includes additional classes.

There were 454 students in the required intern year in the United States and 194 in Canada. The total number of students in the United States taking a required intern year is shown in table 8 for each academic year since 1930-1931. In table 9 the 72 medical schools of the United States are arranged in the order of the size of their student bodies. The median enrolment for these schools was 326 and the average enrolment 341.

Seven medical schools in the United States had 500 or more students with the exclusion of those in the intern year. Three schools had enrolments under 200. The number of schools in these categories in the preceding year was five and six, respectively. In Canada, Toronto, with 671 students, had the largest enrolment. This figure does not include 293 students in the premedical years. The Canadian school having the smallest enrolment was Alberta, with 200 students.

The total enrolments in the schools of the basic medical sciences in this country was 556. Mississippi, with 123, and North Carolina, with 115, had the largest enrolments.

In table 10, the total enrolments in the various classes in the medical and basic science schools in the United States are recorded for each academic session since 1930-1931. During the 1949-1950 session, there were 354 more freshmen, 150 more sophomores, 64 fewer juniors and 552 more seniors than were reported in 1948-1949.

It should be noted that prior to 1942-1943 the totals shown in table 10 are somewhat higher than the sum of the figures for the various classes in a given year. This discrepancy resulted from the inability of certain schools in the earlier years strictly to classify their students into conventional graded classes.

TABLE 9.—*Medical Schools of the United States in Order of Size of Total Enrolment, 1949-1950*

University of Illinois	656
Jefferson Medical College	636
University of Tennessee	578
Northwestern University	526
Tulane University	505
New York University	501
Harvard Medical School	500
University of Michigan	493
Indiana University	492
University of Pennsylvania	487
Temple University	480
New York Medical College	466
University of Minnesota	458
St. Louis University	456
University of Texas	452
State University of New York, Brooklyn	442
Columbia University	442
Georgetown University	414
Tufts College Medical School	403
Louisiana State University	391
University of Louisville	367
Marquette University	364
University of Maryland	362
College of Medical Evangelists	359
Washington University	356
Medical College of Virginia	354
University of Kansas	348
Hahnemann Medical College	342
State University of Iowa	338
University of Cincinnati	337
University of Nebraska	334
University of Pittsburgh	334
George Washington University	333
Western Reserve University	332
Baylor University	327
Cornell University	326
University of Arkansas	323
Stritch School of Medicine	323
Ohio State University	318
Medical College of Georgia	311
University of Wisconsin	306
Duke University	297
Johns Hopkins University	296
University of California	291
Creighton University	283
Howard University	281
Southwestern Medical School	281
University of Buffalo	279
University of Colorado	277
University of Oklahoma	277
University of Virginia	276
University of Oregon	274
University of Rochester	271
University of Southern California	267
Emory University	266
Chicago Medical School	257
Boston University	256
Wayne University	255
University of Chicago	254
Yale University	248
Meharry Medical College	245
Stanford University	240
Medical College of South Carolina	231
Bowman Gray School of Medicine	211
University of Washington	211
Medical College of Alabama	210
State University of New York, Syracuse	209
Vanderbilt University	205
University of Utah	200
Albany Medical College	189
Woman's Medical College	176
University of Vermont	162
Totals	24,547

Distribution of Students by Sex

In table 11 the students enrolled in all the medical and basic science schools in the United States and Canada during the academic year 1949-1950 are classified according to sex. The graduates of each medical school during the same period are also classified according to sex in this table.

Table 12 shows the numbers and percentages of women medical students and graduates in the United States since 1905. The figures for the year 1905 through 1929 include students in all class A, B and C medical schools. The figures for the years from 1930 on are for approved medical schools only.

In 1949-1950 women totaled 1,806, or 7.2 per cent, of the medical students in this country. The total is 303 less than for the preceding year, and the percentage represents a decrease of 1.7 per cent. The percentage of women in the freshman class decreased from 6 per cent in the preceding year to 5.5 per cent. The number of women declined from 407 to 387. Although the total number of women students is the lowest in the last five years, it still exceeds by 630 the largest number of women students enrolled in any one year prior to 1945.

TABLE 10.—*Students in the Medical and Basic Science Schools in the United States, 1931-1950*

Students in the required intern year are not included

	Freshmen	Sophomore	Junior	Senior	Total
1930-1931	6,456	5,538	5,080	4,908	21,982
1931-1932	6,260	5,462	4,932	4,885	22,135
1932-1933	6,426	5,479	5,017	4,948	22,466
1933-1934	6,457	5,571	4,986	4,937	22,799
1934-1935	5,356	5,024	5,142	4,906	22,888
1935-1936	6,006	5,456	5,230	5,020	22,564
1936-1937	5,910	5,260	5,140	5,156	22,095
1937-1938	5,791	5,225	4,986	5,096	21,587
1938-1939	5,764	5,160	4,947	4,931	21,302
1939-1940	5,794	5,177	4,921	4,894	21,271
1940-1941	5,837	5,254	4,989	4,849	21,379
1941-1942	6,218	5,406	5,087	4,942	22,031
1942-1943	6,425	5,829	5,278	5,100	22,631
1943-1944	6,561	6,071	5,610	5,257	23,529
1944 (second session)	6,648	6,140	6,084	5,794	24,666
1944-1945	6,598	5,979	5,709	5,838	24,028
1945-1946	6,060	5,750	5,751	5,655	23,216
1946-1947*	6,564	5,575	5,767	5,904	23,900
1947-1948	6,487	5,738	5,154	5,340	22,739
1948-1949	6,088	6,194	5,702	5,086	23,670
1949-1950	7,042	6,344	6,079	5,638	25,103

* Includes additional classes.

During the period covered by this report, 595 women were graduated from the medical schools in the United States and women constituted 10.7 per cent of all graduates. This is a slight decline from the previous year, when the 612 women who were graduated constituted 12.1 per cent of all graduates in that year.

Dartmouth, Jefferson and North Dakota were the only schools that had no women students. The Woman's Medical College had no men students.

The number of schools in addition to the Woman's Medical College enrolling more than 30 women students decreased from 26 to 15 during 1949-1950. From figures presently available, it is estimated that women will constitute about 5.5 per cent of the entering class in 1950.

In Canada, women numbered 198, or 6.1 per cent, of the total enrolment.

Married Students

It is well known that since the end of the war the number of medical students who marry either before entering medical school or while attending medical school is much larger than before World War II. Because over-all statistics on this point have not been available, each medical school this year was asked to report the number of married students in each class.

TABLE 11.—*Distribution of Students and Graduates by Sex in the United States and Canada, 1949-1950*

	Students		Graduates	
	Men	Women	Men	Women
Medical College of Alabama	200	10	47	4
University of Arkansas	312	11	65	4
University of California	205	25	67	5
College of Medical Evangelists	326	33	59	14
University of Southern California	255	12	55	5
Stanford University	226	14	46	14
University of Colorado	258	19	62	5
Yale University, Connecticut	210	29	38	7
Georgetown University, D. C.	309	21	82	0
George Washington University	393	24	68	10
Howard University	250	31	49	13
Emory University, Georgia	257	9	52	3
Medical College of Georgia	298	13	73	6
Chicago Medical School, Illinois	249	8	41	3
Northwestern University	496	30	126	5
Stritch School of Medicine	309	14	60	8
University of Chicago	232	22	50	7
University of Illinois	602	54	139	22
Indiana University	464	28	86	7
State University of Iowa	314	24	63	7
University of Kansas	326	22	76	7
University of Louisville, Kentucky	350	17	88	2
Louisiana State University	367	24	61	7
Tulane University of Louisiana	471	34	106	12
Johns Hopkins University, Maryland	201	35	56	15
University of Maryland	343	19	70	10
Boston University, Massachusetts	238	18	48	5
Harvard Medical School	476	24	129	4
Tufts College Medical School	378	25	90	12
University of Michigan	450	43	70	13
Wayne University	250	5	56	2
University of Minnesota	434	24	74	13
University of Mississippi	119	4	..	..
University of Missouri	84	7	..	..
St. Louis University	452	4	103	0
Washington University	323	33	71	13
Creighton University, Nebraska	267	16	56	7
University of Nebraska	315	19	74	2
Dartmouth Medical School, New Hampshire	48	0	..	..
Albany Medical College, New York	160	20	43	9
State University of New York, Brooklyn	405	37	83	9
University of Buffalo	229	20	63	9
Columbia University	396	47	95	9
Cornell University	298	28	67	11
New York Medical College	406	60	85	13
New York University	438	63	97	21
University of Rochester	249	23	61	6
State University of New York, Syracuse	191	18	29	9
University of North Carolina	112	3	..	..
Duke University	280	17	68	4
Bowman Gray School of Medicine	108	13	37	4
University of North Dakota	60	0	..	..
University of Cincinnati, Ohio	322	15	69	7
Western Reserve University	299	33	78	13
Ohio State University	302	16	64	4
University of Oklahoma	285	12	69	5
University of Oregon	258	16	49	9
Hahnemann Medical College, Pennsylvania	308	36	69	13
Jefferson Medical College	606	0	152	0
Temple University	435	45	88	12
University of Pennsylvania	457	30	102	13
Woman's Medical College	0	176	0	34
University of Pittsburgh	316	28	63	7
Medical College of South Carolina	220	5	55	2
University of South Dakota	55	4	..	..
University of Tennessee	552	26	133	10
Meharry Medical College	231	14	53	7
Vanderbilt University	192	13	43	6
Southwestern Medical School, Texas	268	13	58	3
University of Texas	421	31	84	9
Baylor University	307	20	66	7
University of Utah	190	10	50	2
University of Vermont	148	14	27	0
University of Virginia	267	9	54	5
Medical College of Virginia	327	27	80	12
University of Washington	197	14	41	3
West Virginia University	56	4	..	..
University of Wisconsin	274	32	59	14
Marquette University	343	21	75	9
University of Alberta, Canada	186	14	37	4
University of Manitoba	275	19	53	10
Dalhousie University	215	11	42	3
Queen's University	251†	21	43	4
University of Western Ontario	261	12	92	1
University of Toronto	620*	51	152	9
McGill University	423	30	104	9
University of Montreal	370	28	81	3
Laval University	500	9	142	2
University of Saskatchewan	58	3	..	..
Totals	26,646	2,004	5,701	640

* Excludes 147 and 146 premedical students respectively.
† Excludes 64 premedical students.

Sixty-four of the medical schools and all seven basic science schools in the United States were able to determine from their records the number of their students who were married. In addition, one four-year school had this information for its freshman and sophomore students. Of the 21,544 students covered by the schools reporting, 8,690, or 40.3 per cent, are married. Figures by classes were freshmen, 24.7 per cent of 6,288 married; sophomores, 35.6 per cent of 5,641 married; juniors, 46.9 per cent of 5,294 married, and seniors, 61.2 per cent of 4,321 married.

Veterans in Medical School

The percentage of veterans enrolled in the medical schools and schools of the basic medical sciences in the United States during 1949-1950 was 65.9 per cent,

TABLE 12.—*Women in Medicine in the United States*

Year	Women Students	Percentage of All Students	Women Graduates	Percentage of All Graduates
1905	1,073	4.1	219	4.0
1910	907	4.0	116	2.6
1915	592	4.0	92	2.6
1920	818	5.8	122	4.0
1925	910	5.0	204	5.1
1926	935	5.0	212	5.4
1927	964	4.9	189	4.7
1928	929	4.5	207	4.9
1929	925	4.4	214	4.8
1930	955	4.4	204	4.5
1931	990	4.5	217	4.6
1932	955	4.3	208	4.2
1933	1,056	4.7	214	4.4
1934	1,020	4.5	211	4.2
1935	1,077	4.7	207	4.1
1936	1,133	5.0	246	4.7
1937	1,113	5.1	238	4.4
1938	1,161	5.4	257	4.6
1939	1,144	5.4	269	5.1
1940	1,145	5.4	253	5.0
1941	1,146	5.4	280	5.3
1942	1,164	5.3	279	5.4
1943	1,150	5.1	241	4.6
1944	1,176	5.0	259	4.7
1944 (second session)	1,141	4.6	232	4.9
1945	1,352	5.6	262	5.1
1946 (to May 31)	1,803	8.0	242	4.2
1947 *	2,183	9.1	342	5.4
1948	2,139	9.5	392	7.1
1949	2,109	8.9	612	12.1
1950	1,806	7.2	595	10.7

* Includes additional classes.

TABLE 13.—*Enrolment by Classes of Veterans and Non-Veterans in the Medical and Basic Science Schools in the United States, 1949-1950*

	Men Veterans	Other Men	Total Men	Women Veterans	Other Women	Total Women	Total Men and Women
Freshmen	4,135	2,520	6,655	17	370	387	7,042
Sophomores	4,983	1,586	5,969	21	354	375	6,344
Juniors	4,398	1,219	5,615	28	436	464	6,079
Seniors	3,528	1,530	5,058	33	547	580	5,638
Totals	16,442	6,855	23,297	99	1,707	1,806	25,103

which is almost identical with the figure 65.8 per cent for the preceding year. Of the total of 25,103 students 16,541 were veterans. Ninety-nine of the veterans were women.

In table 13 the composition of the student body of the medical schools and schools of the basic medical sciences in this country is recapitulated by classes. Veterans comprised 58.9 per cent of the freshman class, a definite decline from the 70 per cent of the preceding year and the peak enrolment of 73.4 per cent veterans in the freshman class that entered medical school in 1947. The percentages of veterans in other classes were sophomores 69.4 per cent, juniors 72.7 per cent and seniors 63.2 per cent.

Negro Medical Students

The total number of Negro medical students enrolled in medical schools in the United States during 1949-1950 was 647, or 2.6 per cent. These students were enrolled in 42 medical schools. Of the total, 513 were enrolled at Meharry Medical College and Howard University and 134 in other institutions. By classes there were 180 freshmen, 166 sophomores, 149 juniors and 152 seniors.

Geographic Source of Freshman Students 1949-1950

Table 14 shows the residence of students in the 1949-1950 freshman class of each medical and basic science school in the United States and Canada. It is recognized that the residence of certain students may be of brief duration, so that their real geographic source may not be revealed by their residence on entering medical school. On the other hand, the birthplace of students is probably no better a criterion of geographic origin since appreciable number of persons have permanent residence elsewhere than in the states of their birth. Table 14 reports the residents of 887 freshmen in Canadian schools. This figure differs somewhat from freshmen enrolment figures given in other tables because table 14 employs the figures for the first class of premedical students at Queen's and Toronto, since these students are already registered in those schools.

The trend of the last four years for medical schools, particularly those owned by states and municipalities, to limit closely the admission of students to residents of the state in which the schools are located continues. The number of schools that admitted no out-of-state students increased from 13 to 15 during the current year. Three years ago only six schools limited their admissions to residents; in the two preceding years every medical school in the United States accepted some out-of-state students.

Four schools, one less than last year, admitted only one or two nonresidents. Twenty-two schools, one more than last year, admitted more nonresident than resident students.

Of the total of 3,453 freshmen students admitted by state and municipal schools during the current year, only 249, or 7.2 per cent, were nonresidents. Last year 8.2 per cent of the freshmen students were nonresidents; in the previous two years 9.8 per cent and 14.8 per cent were from out of state. In 1941-1942 the last prewar year, the freshman enrolment of the state and municipal schools included 17.4 per cent nonresident students.

The privately owned medical schools admitted a total of 3,589 students during the current year. The number of out-of-state students in this group was 1,905, or 53.1 per cent, a slight increase over the percentage for the last three years. In 1941-1942 these schools enrolled 52.9 per cent nonresident students.

In table 15 is recapitulated the number of resident students, students from other states, students from the territories and outlying possessions of the United States, Canadian students and foreign students enrolled in the 1949-1950 freshman class in each school in the United States and Canada.

In table 16 is shown the number of first year medical students from each state per hundred thousand inhabitants. For the nation as a whole, there were 4.8 freshmen students per hundred thousand inhabitants. For the group of 11 states without medical or basic science schools, there were 3.8 first year students per hundred

TABLE 14.—*Residence of Freshman Medical Students*

Marginal Number		1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa
1	Medical College of Alabama	56	..	..	..	..	..	..	..	..	..	..	..	..	..
2	University of Arkansas School of Medicine	..	..	93	..	..	..	..	..	..	..	..	..	..	..
3	University of California Medical School	..	1	..	70	..	..	..	..	..	..	1	..	..	..
4	College of Medical Evangelists	..	..	2	14	..	..	..	..	5	..	4	2	1	3
5	University of Southern California School of Medicine	..	1	..	65	..	..	..	1	..	..	..	..	..	..
6	Stanford University School of Medicine	..	..	..	57	1	..	..	1	..	..	..	..	..	..
7	University of Colorado School of Medicine	..	1	..	..	67	..	..	..	..	..	..	..	..	..
8	Yale University School of Medicine	1	..	..	3	..	14	1	..	..	..	..	3	..	1
9	Georgetown University School of Medicine	1	..	..	1	..	8	..	19	4	..	..	..	..	..
10	George Washington University School of Medicine	3	1	..	5	1	..	..	18	3	..	2	..	2	1
11	Howard University College of Medicine	4	..	..	..	..	..	..	7	..	4	..	2	..	..
12	Emory University School of Medicine	5	..	..	..	..	..	..	..	15	35	..	1	..	..
13	Medical College of Georgia	..	..	..	..	..	..	..	..	..	79	..	..	..	..
14	Chicago Medical School	..	..	..	2	..	1	..	1	1	..	..	13	1	..
15	Stritch School of Medicine of Loyola University	..	..	1	4	..	..	..	..	..	..	..	55	1	..
16	Northwestern University Medical School	1	1	..	5	1	..	..	..	1	1	2	43	7	10
17	University of Chicago, The School of Medicine	..	2	..	5	1	..	..	..	..	..	1	30	3	3
18	University of Illinois College of Medicine	..	..	..	..	..	..	..	..	..	..	..	169	..	..
19	Indiana University School of Medicine	..	..	..	..	..	..	1	..	1	..	..	..	143	..
20	State University of Iowa College of Medicine	..	1	..	..	..	..	..	..	..	..	..	..	..	96
21	University of Kansas School of Medicine	..	1	..	..	..	..	..	..	..	..	..	..	..	..
22	University of Louisville School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	Louisiana State University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	Tulane University of Louisiana School of Medicine	21	..	4	..	..	..	..	..	2	1	..	4	..	1
25	Johns Hopkins University School of Medicine	2	..	..	8	1	..	..	1	3	4	..	2	2	..
26	University of Maryland School of Medicine	..	..	..	..	..	1	..	2	3	5	..	1	..	..
27	Boston University School of Medicine	..	1	..	4	..	8	1	..	..	4	..	3	2	..
28	Harvard Medical School	1	1	1	5	1	6	..	..	..	..	..	4	..	..
29	Tufts College Medical School	..	..	..	..	..	8	..	..	..	..	1	..	..	..
30	University of Michigan Medical School	..	..	..	1	..	..	..	..	1	..	..	..	..	..
31	Wayne University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
32	University of Minnesota Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..
33	University of Mississippi School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
34	University of Missouri School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	St. Louis University School of Medicine	1	1	1	4	3	1	..	..	1	1	3	9	3	2
36	Washington University School of Medicine	..	2	..	5	..	..	..	..	3	..	2	3	1	3
37	Creighton University School of Medicine	..	..	..	8	2	..	..	..	..	..	..	1	..	8
38	University of Nebraska College of Medicine	..	1	..	..	..	..	..	..	..	..	..	..	..	1
39	Dartmouth Medical School	..	..	..	2	..	2	..	..	..	..	..	2	..	..
40	Albany Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..
41	State University of New York, State University Medical Center at New York City	..	..	..	..	..	1	..	..	..	..	..	1	..	..
42	University of Buffalo School of Medicine	..	1	..	1	..	..	..	..	..	..	..	..	..	..
43	Columbia University College of Physicians and Surgeons	2	3	..	..	1	3	1	..	1	1	1	1	1	1
44	Cornell University Medical College	..	..	..	..	..	2	..	1	1	..	1	..	1	..
45	New York Medical College, Flower and Fifth Avenue Hospitals	4	..	..	..	..	10	..	1	..	..	..	1	..	..
46	New York University College of Medicine	..	..	..	1	..	5	..	1	1	..	..	..	..	..
47	University of Rochester School of Medicine and Dentistry	..	..	1	7	..	..	..	1	1	2	..	2	1	1
48	State University of New York, Medical Center at Syracuse University	..	..	..	..	..	2	..	..	2	..	..	1	..	..
49	University of North Carolina School of Medicine	..	..	..	..	..	..	..	..	1	1	..	..	..	..
50	Duke University School of Medicine	2	..	..	..	..	..	..	..	6	2	..	..	..	..
51	Bowman Gray School of Medicine	..	..	1	..	..	..	..	..	3	2	..	..	..	..
52	University of North Dakota School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
53	University of Cincinnati College of Medicine	..	..	..	..	..	..	..	..	1	..	..	..	5	..
54	Western Reserve University School of Medicine	1	..	..	.	..	..	..	..	1	..	..	..	..	1
55	Ohio State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
56	University of Oklahoma School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	University of Oregon Medical School	..	..	..	2	..	..	..	..	..	..	8	..	..	..
58	Hahnemann Medical College	1	1	..	1	..	..	..	..	2	..	1	..	1	..
59	Jefferson Medical College of Philadelphia	1	..	..	3	..	2	3	..	2	1	1	2	..	..
60	Temple University School of Medicine	..	..	..	2	..	..	..	1	3	..	..	..	..	..
61	University of Pennsylvania School of Medicine	6	..	..	..	..	1	1	..	3	..	..	1	..	..
62	Woman's Medical College of Pennsylvania	..	1	..	8	..	..	..	1	..	..	..	3	..	1
63	University of Pittsburgh School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	Medical College of the State of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..
65	University of South Dakota School of Medical Sciences	..	..	..	..	..	..	..	..	..	..	..	..	..	..
66	University of Tennessee College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
67	Meharry Medical College	1	..	3	1	..	..	1	1	4	3	..	3	..	1
68	Vanderbilt University School of Medicine	4	..	..	..	..	..	..	..	4	1	..	..	..	..
69	Southwestern Medical School of the University of Texas	..	1	1	..	..	..	..	..	..	..	..	..	..	..
70	University of Texas School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71	Baylor University College of Medicine	..	3	1	..	..	..	..	..	..	..	..	..	..	..
72	University of Utah School of Medicine	..	..	..	..	..	..	..	..	..	..	3	..	..	..
73	University of Vermont College of Medicine	..	..	..	..	..	2	..	..	..	..	..	..	..	..
74	University of Virginia Department of Medicine	..	..	1	..	..	1	..	..	1	1	..	..	..	..
75	Medical College of Virginia	..	..	..	1	..	..	1	..	..	2	..	..	..	..
76	University of Washington School of Medicine	..	..	..	..	..	..	..	..	..	..	1	..	..	..
77	West Virginia University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	University of Wisconsin Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	Marquette University School of Medicine	..	..	..	4	1	..	..	..	1	..	..	4	3	..
80	University of Alberta Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
81	University of Manitoba Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
82	Dalhousie University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	Queen's University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
84	University of Western Ontario Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	University of Toronto Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86	McGill University Faculty of Medicine	..	..	..	9	..	4	..	..	..	..	..	..	..	..
87	University of Montreal Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88	Laval University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89	University of Saskatchewan School of Medical Sciences	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Totals	113	25	110	308	80	83	10	57	81	116	32	366	178	134
		1	2	3	4	5	6	7	8	9	10	11	12	13	14

* Figures are for students in beginning premedical year.
† Figures include two freshman classes.

in the United States and Canada, 1949-1950

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Territories and Possessions	Canada	Foreign	Totals	Marginal Number
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	56	1
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	93	2
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	3
2	..	..	..	2	1	4	4	..	2	..	4	..	1	..	1	..	2	2	1	..	2	2	..	..	..	3	2	..	..	..	6	..	2	..	2	8	13	97	4
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	69	5
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	2	..	..	63	6
..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	77	7
2	..	..	..	6	1	1	..	..	..	..	..	..	3	..	17	..	..	..	..	1	5	2	..	..	..	1	..	1	..	1	..	1	..	..	1	..	..	65	8
..	..	..	..	5	8	1	..	..	..	..	..	..	21	..	25	..	..	..	4	..	..	13	2	..	..	..	..	..	..	2	1	..	..	1	3	..	1	120	9
1	1	1	1	9	..	3	1	..	..	1	1	..	5	1	5	..	..	..	5	1	..	7	..	..	..	2	2	1	..	2	2	1	5	..	1	..	..	94	10
..	..	3	..	2	..	1	..	2	..	..	..	..	2	..	10	5	..	4	2	..	5	..	2	..	..	3	..	..	7	1	3	1	..	1	..	5	76	11
..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	1	2	..	..	..	..	..	..	1	3	..	3	..	..	1	..	2	..	..	..	..	1	73	12
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	79	13
..	..	..	..	1	..	1	..	1	..	..	..	..	8	..	29	..	..	3	..	..	..	8	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	72	14
..	..	..	..	..	..	2	2	..	1	..	..	..	..	..	2	..	1	12	..	..	..	5	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	90	15
7	1	..	..	..	1	4	2	..	1	4	1	1	..	..	2	..	2	13	1	1	..	..	..	3	..	1	1	1	..	..	2	1	7	2	1	..	1	131	16
2	1	1	..	..	1	1	1	..	..	1	2	..	..	..	..	2	..	..	5	1	1	2	..	..	..	..	..	..	..	1	..	..	..	..	2	..	3	72	17
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	169	18
..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	150	19
..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	100	20
95	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	100	21
1	90	..	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	96	22
..	..	125	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	125	23
..	2	39	..	..	1	1	1	21	3	..	..	..	2	..	8	..	..	..	2	..	1	..	..	1	9	..	..	1	..	..	..	..	..	..	3	..	1	129	24
..	1	..	..	22	2	2	..	1	..	..	..	..	4	1	4	1	..	3	..	..	..	1	..	..	1	..	3	..	..	2	..	2	..	..	1	2	2	78	25
..	..	..	..	58	..	..	..	..	..	1	..	1	2	..	..	3	..	4	..	..	..	3	..	1	..	..	..	1	..	..	..	9	..	..	3	..	..	98	26
..	..	..	..	..	29	..	..	..	..	1	1	4	3	..	8	1	..	1	..	..	..	1	1	1	..	..	..	..	..	..	1	..	..	..	3	..	..	74	27
1	1	..	1	..	17	..	2	1	1	1	..	..	1	7	..	32	3	..	6	..	..	2	3	1	..	..	..	..	1	..	2	2	4	..	1	..	..	111	28
..	..	..	8	1	70	..	..	..	..	..	..	..	1	2	..	7	..	..	..	..	..	..	12	..	..	..	1	..	..	..	..	..	..	..	..	1	112	29
1	..	..	..	..	..	136	1	..	2	1	..	..	..	1	..	2	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	151	30
..	..	..	..	..	..	68	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	68	31
..	..	..	..	..	..	..	116	..	..	2	..	..	..	..	..	..	5	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	124	32
..	..	..	..	..	..	..	..	62	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62†	33
..	..	..	..	..	..	..	..	..	45	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	34
..	6	1	..	..	1	3	4	..	18	3	..	..	1	..	..	..	..	..	16	..	2	7	..	..	1	..	1	..	..	..	14	3	3	1	4	1	2	122	35
2	2	..	1	..	..	..	..	..	36	2	..	..	1	1	7	..	..	3	1	1	2	..	..	..	1	1	..	..	..	2	..	1	2	2	..	..	87	36
4	1	..	..	..	..	4	..	..	3	4	18	..	..	1	1	..	..	..	1	1	..	..	..	3	..	..	1	..	..	6	..	..	..	4	..	5	76	37
..	..	..	..	..	..	..	..	..	..	1	80	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	1	..	1	88	38
..	..	..	1	2	..	1	..	..	1	..	..	1	5	..	4	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	24	39
..	..	..	1	..	..	..	..	..	..	..	..	..	3	..	48	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	54	40
..	..	..	..	..	1	..	..	..	1	..	..	..	16	..	126	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	150	41
..	..	..	..	..	1	..	1	..	..	..	..	..	3	..	55	..	..	2	..	..	..	4	..	..	..	..	..	..	1	..	..	..	..	2	3	1	75	42
2	..	..	1	..	9	1	..	1	..	2	..	1	11	..	54	1	..	3	..	..	..	8	..	..	..	1	..	..	1	..	..	1	..	3	1	4	120	43
1	..	..	1	1	2	2	1	..	..	1	..	..	10	..	47	..	..	5	..	..	..	2	..	2	..	..	1	..	..	1	..	1	..	..	..	..	84	44
..	..	..	..	..	6	..	..	..	..	..	1	..	8	..	86	..	..	3	..	..	..	1	2	..	..	1	..	..	..	..	..	..	..	..	..	..	124	45
..	..	..	..	1	2	..	..	..	..	1	1	..	1	9	..	92	..	..	..	1	1	3	1	..	..	..	..	..	..	..	..	..	..	..	1	3	125	46
..	1	..	2	..	3	2	2	..	1	..	..	..	..	4	..	27	..	..	3	..	..	6	..	..	..	..	..	..	..	..	..	1	..	1	..	..	69	47
..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	39	..	..	1	1	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	2	76	48
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	58	49
..	2	1	..	1	..	..	..	..	..	..	..	..	2	..	2	40	..	1	1	..	1	..	8	..	..	..	..	..	5	..	2	..	..	..	..	..	76	50
..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	44	..	1	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	57	51
..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	52
..	9	..	..	..	..	1	..	..	..	..	..	..	1	..	1	..	..	70	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	90	53
1	..	..	1	..	1	2	..	..	..	..	..	..	..	..	3	..	1	60	..	..	4	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..	..	80	54
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89	55
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	56
..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	57	..	..	..	..	..	..	..	..	..	5	..	..	..	..	2	1	76	57
..	..	..	..	..	3	..	..	..	..	..	..	..	11	..	6	..	..	1	..	..	72	2	..	..	..	..	..	..	..	1	..	..	2	..	..	..	105	58
1	..	..	..	..	1	..	..	1	..	..	..	..	16	..	4	5	..	7	..	..	103	..	..	..	1	..	..	..	..	..	1	9	..	..	2	..	..	166	59
..	1	..	..	1	..	..	..	..	..	..	..	..	1	10	..	4	1	2	..	..	94	..	2	..	..	1	1	..	1	1	2	..	..	3	..	2	131	60
..	1	..	..	3	1	..	..	..	1	..	..	..	15	..	10	3	..	3	..	..	64	..	2	..	..	2	..	3	1	..	2	..	1	..	1	..	126	61
..	2	..	1	1	1	1	1	..	..	..	..	..	3	..	11	..	..	1	..	..	9	..	1	..	..	..	..	..	..	1	..	1	..	1	..	1	50	62
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	99	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	100	63
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60	..	..	..	..	..	..	..	..	..	..	..	..	60	64
..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32	..	..	..	..	..	..	..	..	..	..	..	..	33	65
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	145	..	..	..	..	..	..	..	..	..	..	..	145	66
..	2	3	..	1	..	4	..	..	..	..	..	..	3	..	10	1	..	5	1	..	..	..	2	..	2	4	..	..	5	..	1	1	..	..	2	65	67
..	5	..	..	..	1	..	..	6	..	1	..	..	..	..	1	..	..	1	1	..	..	..	1	..	24	..	..	..	1	..	1	..	..	..	..	..	52	68
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	94	..	..	..	..	..	..	..	1	..	..	100	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	164	..	..	..	..	..	..	..	..	..	..	..	164	70
..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	88	..	..	..	..	..	..	1	..	..	..	..	98	71
..	1	..	1	..	4	..	..	..	..	..	..	1	2	..	6	..	..	..	..	..	..	..	2	..	..	..	48	..	28	..	..	..	..	..	..	..	52	72
..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	1	1	..	..	..	..	1	..	1	..	1	2	..	..	60	..	2	..	..	2	..	..	45	73
..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	71	..	1	..	..	1	..	2	77	74
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	67	..	..	..	2	3	..	84	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..	..	..	..	..	75	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	85	..	..	..	..	31	77
..	1	..	..	..	..	11	6	..	..	..	..	..	2	1	2	..	..	2	..	..	2	..	..	3	..	1	..	..	..	..	2	56	..	..	..	..	85	78
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	..	102	79
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	..	50	80
..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	52	5	73	81
..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	61	..	58	82
..	..	..	1	..	1	..	..	..	1	..	..	..	1	2	..	6	1	..	..	1	1	1	..	..	..	..	..	..	1	1	2	..	..	..	84	5	146	83
..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	116	4	122	84
..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	152	..	159	85
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32	..	32	86
123	132	174	21	110	176	256	154	97	120	30	111	3	19	208	13	830	172	39	347	96	89	546	30	90	44	185	382	55	33	165	117	90	172	14	61	845	73	7,929
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53

TABLE 15.—*Residence of Freshman Students in Medical and Basic Science Schools in the United States and Canada, 1949-1950*

	Home State	Other State	Terr. & Poss.	Canadian	Foreign	Totals
Medical College of Alabama	56	0	0	0	0	56
University of Arkansas	93	0	0	0	0	93
University of California	70	2	0	0	0	72
College of Medical Evangelists	14	60	2	8	13	97
University of Southern California	65	4	0	0	0	69
Stanford University	57	4	2	0	0	63
University of Colorado	67	10	0	0	0	77
Yale University (Connecticut)	14	50	1	0	0	65
Georgetown University (Dist. of Columbia)	19	97	3	0	1	120
George Washington University	18	75	1	0	0	94
Howard University	7	63	1	0	5	76
Emory University (Georgia)	35	37	0	0	1	73
Medical College of Georgia	79	0	0	0	0	79
Chicago Medical School (Illinois)	13	59	0	0	0	72
Northwestern University	43	86	1	0	1	131
Stritch School of Medicine	55	33	2	0	0	90
University of Chicago	30	37	2	0	3	72
University of Illinois	169	0	0	0	0	169
Indiana University	143	5	0	0	2	150
State University of Iowa	96	4	0	0	0	100
University of Kansas	95	4	0	0	1	100
University of Louisville (Kentucky)	90	5	1	0	0	96
Louisiana State University	125	0	0	0	0	125
Tulane University of Louisiana	39	86	3	1	0	129
Johns Hopkins University (Maryland)	22	51	1	2	2	78
University of Maryland	58	37	3	0	0	98
Boston University (Massachusetts)	29	42	3	0	0	74
Harvard Medical School	17	93	1	0	0	111
Tufts College Medical School	70	41	0	0	1	112
University of Michigan	136	14	1	0	0	151
Wayne University	68	0	0	0	0	68
University of Minnesota	116	8	0	0	0	124
University of Mississippi	62	0	0	0	0	62*
University of Missouri	45	0	0	0	0	45
St. Louis University	18	97	4	1	2	122
Washington University	36	49	2	0	0	87
Creighton University (Nebraska)	18	49	4	0	5	76
University of Nebraska	80	6	1	0	1	88
Dartmouth Med. School (New Hampshire)	1	23	0	0	0	24
Albany Medical College (New York)	48	5	1	0	0	54
State University of New York, Brooklyn	126	24	0	0	0	150
University of Buffalo	55	14	2	3	1	75
Columbia University	54	56	3	1	4	120
Cornell University	47	37	0	0	0	84
New York Medical College	86	38	0	0	0	124
New York University	92	29	0	1	3	125
University of Rochester	27	42	0	0	0	69
State University of New York, Syracuse	59	14	1	0	2	76
University of North Carolina	53	5	0	0	0	58
Duke University	40	36	0	0	0	76
Bowman Gray School of Medicine	44	13	0	0	0	57
University of North Dakota	28	2	0	0	0	30
University of Cincinnati (Ohio)	70	20	0	0	0	90
Western Reserve University	60	20	0	0	0	80
Ohio State University	89	0	0	0	0	89
University of Oklahoma	80	0	0	0	0	80
University of Oregon	57	0	16	2	1	76
Hahnemann Med. College (Pennsylvania)	72	31	2	0	0	105
Jefferson Medical College	103	61	2	0	0	166
Temple University	94	32	3	0	2	131
University of Pennsylvania	64	60	1	0	1	126
Woman's Medical College	9	39	1	0	1	50
University of Pittsburgh	99	1	0	0	0	100
Medical College of South Carolina	60	0	0	0	0	60
University of South Dakota	33	1	0	0	0	33
University of Tennessee	145	0	0	0	0	145
Meharry Medical College	2	61	0	0	2	65
Vanderbilt University	24	28	0	0	0	52
Southwestern Medical School (Texas)	94	5	1	0	0	100
Baylor University	88	5	0	0	0	93
University of Texas	164	0	0	0	0	164
University of Utah	45	4	0	0	0	52
University of Vermont	28	17	0	0	0	45
University of Virginia	60	15	2	0	0	77
Medical College of Virginia	71	10	1	0	2	84
University of Washington	67	3	2	3	0	75
West Virginia University	31	0	0	0	0	31
University of Wisconsin	85	0	0	0	0	85
Marquette University	56	46	0	0	0	102
University of Alberta	0	0	0	50	0	50
University of Manitoba	0	0	0	73	0	73
Dalhousie University, Nova Scotia	0	1	0	52	5	58
Queen's University, Ontario	0	3	0	61	0	64†
University of Western Ontario	0	2	0	58	0	60
University of Toronto	0	0	0	146	1	147†
McGill University, Quebec	0	33	0	84	5	122
University of Montreal	0	2	0	116	4	122
Laval University	0	7	0	132	0	139
University of Saskatchewan	0	0	0	32	0	32
Totals	4,873	2,061	77	846	72	7,929

* Figures include two freshman classes.
† Figures are for students in beginning premedical year.

thousand population. Those states with medical or basic science schools had an average of 4.9 students per hundred thousand of population enrolled as freshmen.

There were 77 freshman students, 20 more than last year, from the territories and outlying possessions of the United States. All these students were enrolled in schools in the United States. Twenty-two students from Canada, five more than last year, were enrolled as freshmen in schools in this country. Fifty-seven students from other foreign countries, 15 more than a year ago, were enrolled in the freshman classes in 22 medical schools in the United States. Of the 887 beginning students in the Canadian schools, 48 came from the United States, 15 more than last year and 29 more than in the preceding year. Canadian schools enrolled 15 beginning students from other foreign countries.

TABLE 16.—*Ratio of Freshmen Medical Students[1] to State Populations, 1949-1950.*

Number of students per 100,000 of population[2] in the medical and basic science schools of the United States

*Nevada	1.7	Mississippi	4.6
*New Mexico	2.2	West Virginia	4.6
*Maine	2.3	*Wyoming	4.9
California	2.9	Iowa	5.1
Missouri	3.0	Maryland	5.1
*Delaware	3.2	Pennsylvania	5.1
*Florida	3.2	Texas	5.1
*Arizona	3.4	Wisconsin	5.1
New Hampshire	3.5	Minnesota	5.2
Massachusetts	3.7	Virginia	5.2
Alabama	4.0	*Idaho	5.4
Michigan	4.0	Arkansas	5.6
Oregon	4.0	Tennessee	5.7
*Rhode Island	4.0	*Montana	5.8
Connecticut	4.1	New York	5.8
Oklahoma	4.2	Kansas	6.3
Illinois	4.3	North Dakota	6.4
*New Jersey	4.3	Colorado	6.6
Ohio	4.3	District of Columbia	6.6
Indiana	4.5	Louisiana	6.6
North Carolina	4.5	South Dakota	6.8
South Carolina	4.5	Utah	8.1
Washington	4.5	Nebraska	8.6
Georgia	4.6	Vermont	8.9
Kentucky	4.6		

* State with no medical school.
1. Calculations based on one freshman class for each school, except University of Mississippi.
2. Pop. Est. (Nov. 4, 1949) Dept. of Commerce.

Required Internships

Seven schools in the United States and three in Canada require their students to serve an internship. These schools are listed in table 17. There has been no change in this list since the publication of the last Educational Number. All except one of these schools withhold the degree of Doctor of Medicine until the year of internship has been served. Duke issues the degree at the end of the four year medical course but obtains from each student a written agreement that he will spend two years in training in a hospital or a laboratory. Several of the other schools requiring an internship will permit a student to substitute a year of laboratory work.

TABLE 17.—*Medical Schools Requiring an Internship*

United States
College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Chicago Medical School
Northwestern University Medical School
University of Minnesota Medical School
Duke University School of Medicine *
Canada
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Montreal Faculty of Medicine

* Degree not withheld until internship completed.

Although only seven schools in the United States require an internship of their students, for many years more than 99 per cent of all graduates have voluntarily served an internship of at least one year's duration and the majority have had additional hospital training before entering the practice of medicine.

The number of students from schools in this country in the required intern year is shown for each year since 1930-1931 in table 8. The licensing boards of 23 states, the District of Columbia, Alaska, Hawaii, the Virgin Islands and the Canal Zone require a year of internship for licensure. Puerto Rico, which formerly required a two year internship, now requires only a one year internship. During the past year, New Mexico discontinued the requirement of an internship for licensure. The licensing boards that require an internship are listed in table 18. This table also indicates those states that require a rotating internship.

Five states (Connecticut, Maryland, Missouri, Texas and Virginia) whose laws do not require internship training withhold the licenses of candidates from schools requiring an internship for the degree of Doctor of Medicine until the internship is completed. In these states the examination may be taken at any time after the completion of the medical school course.

TABLE 18.—*Medical Licensing Boards Requiring a One Year Internship**

Alabama	New Hampshire	Washington [1]
Arizona	New Jersey [1]	West Virginia
Delaware [1]	North Dakota	Wisconsin
District of Columbia	Oklahoma [1]	Wyoming
Idaho [2]	Oregon	Alaska
Illinois [1]	Pennsylvania [1]	Canal Zone [1]
Iowa [2]	Rhode Island [1]	Hawaii [1]
Michigan [1]	South Dakota	Puerto Rico [1]
Montana	Utah [1]	Virgin Islands
Nevada	Vermont [1]	

* Some other states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.
1. Internship must be a rotating service.
2. Internship must be a straight service.

Some states, in addition to those listed in table 18, require an internship of graduates from outside the United States and Canada and of applicants for reciprocity or endorsement.

The hospitals approved for intern training by the Council on Medical Education and Hospitals of the American Medical Association are generally acceptable in those states requiring an internship for licensure. The current list of approved internships was published in the April 15, 1950 issue of THE JOURNAL. Additions to this list appear on page 135 of this issue.

Responsibilities of Medical Schools for Other Students

In recent years increasing attention has been focused on the heavy responsibilities that many medical schools carry for the instruction of large numbers of students other than those regularly enrolled as undergraduate medical students. In table 19 are listed for the United States and Canada those students other than regular medical students and students in the required intern year who were receiving instruction under the auspices of the medical schools in 1949-1950.

Thirty-two medical schools in the United States enrolled 1,125 physicians who were working toward advanced degrees. The largest number, 337, was at Minnesota. Six Canadian schools enrolled 122 physicians for similar work.

Other graduate students who were working for advanced degrees in the basic medical sciences numbered 2,094 in the United States and 59 in Canada. These students were distributed among 60 schools in the United States and five schools in Canada. The University of Chicago, with 300, reported the largest number of such students.

The total number of graduate students in the United States in the two categories just described was 3,219. This figure may be compared with the total of 2,898 reported last year and with the highest prewar total, 1,167, for the academic year 1940-1941. It can be seen that during the past year there has been a further increase in the number of persons pursuing graduate study in the medical sciences and that the number of persons now so engaged is nearly three times the number reported for any one year prior to World War II.

In addition to the students working for advanced degrees, there were 2,720 nonmedical students taking courses in the medical schools in the United States and 78 in Canada. This number, which largely represents students from other departments of the universities, such as schools of dentistry, public health, nursing, engineering and the liberal arts colleges, is probably less than the actual total of students who receive training through the facilities and from the faculties of the medical schools, since several medical schools which are known to have responsibility for students in other departments of the university reported no students in this category.

Thirty medical schools in the United States reported a total of 1,087 physicians enrolled in formal basic science courses in preparation for certification by a specialty board. Last year 1,697 physicians were enrolled in such courses in 40 medical schools. This total does not include persons reported under the category of physicians working for advanced degrees who might also be preparing for certification. Northwestern with 200 students had the largest enrolment in this category. Seventy-nine students were enrolled in similar courses in three Canadian medical schools.

Fifty-two medical schools in the United States reported a total enrolment of 17,930 physicians in refresher or continuation courses. Last year 49 schools reported 15,695 physicians in such courses. In Canada 649 physicians were enrolled in six schools for courses of this type.

One hundred and ten part time or special students working toward the degree of Doctor of Medicine were enrolled in 29 medical schools in the United States. Three such students were reported by two Canadian schools.

Fifty-five medical schools in the United States reported that they were primarily responsible for the instruction and supervision of a total of 1,960 interns. This total is undoubtedly incomplete, since several medical schools which do not actually own and operate their own hospitals reported no interns in this category although the faculties of these schools carry the major responsibility for the training of interns in their affiliated hospitals. Four Canadian schools reported that they were responsible for the instruction and supervision of 313 interns.

Fifty-nine medical schools in the United States reported that they were primarily responsible for the instruction and supervision of a total of 4,345 residents. This figure is probably also incomplete for the same reasons as those cited above with respect to interns. Two Canadian schools reported responsibility for 24 residents.

TABLE 19.—*Other Students for Whom Medical Schools Were Responsible, 1949-1950*

School	Part Time or Special Medical Students Working Toward M.D. Degree	Physicians Enrolled for Advanced Degrees	Other Graduate Students Working for Degrees in Basic Medical Sciences	Nonmedical Students Taking Medical Courses	Physicians Enrolled in Refresher or Continuation Courses	Physicians Enrolled in Formal Basic Science Courses in Preparation for Specialty Board Certification	Physicians Holding Appointments as Fellows	Interns for Whose Instruction and Supervision the Medical School was Primarily Responsible	Residents for Whose Instruction and Supervision the Medical School was Primarily Responsible	Totals
Medical College of Alabama	3	2	10	18	5	10	4	28	64	144
University of Arkansas	6	0	8	32	46	0	0	7	47	146
College of Medical Evangelists (Calif.)	0	8	0	0	182	40	0	158	174	563
Stanford University	1	0	0	0	137	0	36	46	76	296
University of California	0	0	0	0	929	43	25	50	79	1,126
University of Southern California	0	22	45	0	370	0	6	125	120	699
University of Colorado	1	200	60	27	0	0	1	12	154	455
Yale University (Connecticut)	0	0	96	6	525	37	52	39	72	827
George Washington University (D. C.)	0	0	62	0	300	0	23	17	40	442
Georgetown University	0	2	6	9	22	0	15	10	70	135
Howard University	0	0	0	0	0	0	7	17	38	62
Emory University (Georgia)	1	0	9	7	3	0	6	41	143	210
Medical College of Georgia	9	0	0	3	113	8	2	6	55	196
Chicago Medical School (Illinois)	0	0	0	0	0	0	0	0	0	0
Northwestern University	7	60	51	1	25	200	12	134	200	699
Stritch School of Medicine	3	1	37	0	0	15	0	0	0	56
University of Chicago	0	4	300	0	0	0	8	31	111	454
University of Illinois	0	66	107	30	0	21	0	23	56	303
Indiana University	2	13	0	0	0	0	0	30	102	147
State University of Iowa	0	3	71	2,069	247	30	0	18	124	2,562
University of Kansas	0	20	6	0	918	2	2	21	50	1,019
University of Louisville (Kentucky)	0	0	19	0	681	0	3	17	75	788
Louisiana State University	1	0	3	0	56	79	0	0	0	139
Tulane University	0	86	34	0	226	34	0	37	87	504
Johns Hopkins University (Maryland)	0	0	0	0	48	0	86	0	0	134
University of Maryland	0	0	21	0	140	5	19	33	67	285
Boston University (Massachusetts)	1	0	41	0	0	0	0	0	5	47
Harvard Medical School	0	0	50	0	400	103	277	0	0	830
Tufts College Medical School	0	1	20	0	479	0	37	0	0	537
University of Michigan	3	0	0	17	1,894	36	0	49	138	2,130
Wayne University	0	109	20	0	280	30	13	0	0	452
University of Minnesota	0	337	181	0	1,112	0	0	0	0	1,630
University of Mississippi	0	0	13	95	0	1	0	0	0	118
St. Louis University (Missouri)	3	35	20	80	0	2	2	30	55	246
University of Missouri	8	0	8	4	1	0	0	0	0	21
Washington University	0	1	48	0	180	67	27	53	94	470
Creighton University (Nebraska)	0	6	1	1	11	0	0	19	20	58
University of Nebraska	0	0	9	1	15	2	0	10	44	81
Dartmouth Medical School (New Hampshire)	0	0	0	0	0	0	0	0	59	59
Albany Medical College (New York)	7	0	0	0	75	0	6	32	39	159
Columbia University	0	5	80	4	989	132	24	178	81	1,393
Cornell University	0	0	18	0	60	24	33	0	0	135
State University of New York, Brooklyn	0	21	0	0	0	0	0	22	47	90
New York Medical College	2	29	0	0	154	0	0	17	27	229
New York University	0	0	82	5	1,539	0	36	58	71	1,791
State University of New York, Syracuse	0	0	3	0	155	0	0	20	59	237
University of Buffalo	0	0	25	0	70	3	0	0	0	98
University of Rochester	0	0	0	0	64	0	46	35	105	250
Duke University (North Carolina)	0	0	10	0	98	5	14	62	66	255
University of North Carolina	4	0	22	36	381	0	2	0	0	445
Bowman Gray School of Medicine	0	0	9	0	0	0	0	16	62	87
University of North Dakota	4	0	3	0	0	0	0	0	1	8
Ohio State University	0	19	18	0	0	0	4	23	59	123
University of Cincinnati	1	7	32	5	377	0	36	44	102	604
Western Reserve University	0	0	71	7	168	49	56	54	65	470
University of Oklahoma	0	4	4	4	525	50	7	23	72	689
University of Oregon	9	3	16	1	470	0	2	16	72	589
Hahnemann Medical College (Pennsylvania)	0	0	1	0	0	0	0	0	0	1
Jefferson Medical College	0	0	22	0	0	0	8	5	51	86
Temple University	0	0	0	0	81	0	0	0	76	157
University of Pennsylvania	0	0	134	1	39	0	112	26	97	409
University of Pittsburgh	3	3	0	0	0	0	0	17	134	157
Woman's Medical College	0	0	0	0	0	0	7	6	11	24
Medical College of South Carolina	0	1	6	0	250	0	0	9	34	300
University of South Dakota	5	0	8	0	0	0	0	0	0	13
Meharry Medical College (Tennessee)	7	0	6	8	26	0	0	6	13	66
University of Tennessee	0	17	28	6	0	0	0	0	0	51
Vanderbilt University	0	0	7	0	0	0	13	28	46	94
Baylor University (Texas)	0	0	0	0	181	6	3	0	0	190
Southwestern Medical School	2	0	6	1	0	18	2	41	195	265
University of Texas	0	2	13	0	817	0	7	24	82	945
University of Utah	1	2	33	130	80	0	15	25	61	347
University of Vermont	1	0	8	16	0	10	15	0	0	50
Medical College of Virginia	0	3	5	3	1,350	25	7	25	91	1,518
University of Virginia	0	3	0	0	0	0	12	31	62	108
University of Washington	0	0	35	29	320	0	11	23	25	443
West Virginia University	2	0	3	0	0	0	0	0	0	5
Marquette University (Wisconsin)	5	0	9	0	0	0	0	0	0	14
University of Wisconsin	0	0	28	65	338	0	0	20	70	541
Totals	110	1,125	2,094	3,720	17,930	1,087	1,135	1,960	4,345	32,506
CANADA										
University of Alberta	0	0	9	35	192	3	0	0	0	239
University of Manitoba	1	9	3	0	62	9	9	65	0	158
Dalhousie University (Nova Scotia)	0	0	0	0	0	0	0	45	0	45
Queen's University (Ontario)	0	3	0	33	55	0	9	0	0	100
University of Toronto	0	78	9	0	111	67	69	84	13	431
University of Western Ontario	2	18	30	3	0	0	6	0	11	70
Laval University (Quebec)	0	14	0	0	0	0	0	119	0	133
McGill University	0	0	0	4	219	0	0	0	0	223
University of Montreal	0	0	0	0	9	0	0	0	0	9
University of Saskatchewan	0	0	8	4	0	0	0	0	0	12
Totals	3	122	59	78	649	79	93	313	24	1,420

In 46 medical schools in the United States there were 1,135 physicians holding appointments as fellows who were not reported in any of the foregoing categories. While many of these men were discharging significant responsibilities in teaching and research, they represent still another group of young physicians who were receiving further training under the auspices of the medical schools. Four Canadian schools reported 93 physicians holding fellowships.

The students reported in the above categories total 32,506 for the medical schools in the United States and 1,420 for the Canadian schools. As already pointed out, these figures are not complete, but even these incomplete figures reveal that the number of other students for whom the medical schools have definite educational responsibilities now exceeds by approximately 30 per cent the number of undergraduate medical students.

It is clear from these figures that the contribution of a medical school to education and to society will be seriously underestimated if it is measured only in terms of the number of undergraduate students enrolled. It has been recognized for a long time that the service and research programs conducted by the medical schools have constituted major activities. It is now becoming very evident that the other students for whom the medical schools have accepted responsibility form still another major activity. Because of these considerations, it is no longer accurate or realistic, as Dr. John Deitrick, Director of the Survey of Medical Education has carefully pointed out, to divide the budget of a medical school by the number of its undergraduate students and maintain that the figures so obtained represent the annual cost of educating a medical student in that school.

Preprofessional Requirements and Record of 1949 Freshman Class

The minimum requirements of the Council on Medical Education and Hospitals for admission to approved medical schools since 1918 has been two years of college training. In 1938 the Council recommended that at least three years of college work be required of all candidates for admission. With the exception of California, the state licensing boards require that an applicant for licensure present evidence of having completed two years of college. Seventy-six of the 79 medical and basic science schools in the United States require three or more years of premedical work. Six of the Canadian schools have a similar requirement. Nine schools, Georgetown, the Chicago Medical School, Kansas, Johns Hopkins, Cornell, New York Medical College, Vanderbilt, Montreal and Laval, require a bachelor's degree. Georgetown, however, requires only 90 semester hours of college work from veterans. Cornell, Kansas and Vanderbilt will accept students with three years of college work, provided their colleges will grant them a bachelor's degree on the successful completion of the first year of medical school.

Statistics for the freshman class that entered medical school during the past academic year reveal that 4,435, or 63 per cent, of the freshman students in the schools of this country had baccalaureate degrees; 617, or 8.8 per cent, had attended college four years but had received no degree; 1,920, or 27.2 per cent, had had three years of college work, and only 70, or 1 per cent, had had only two years of college.

Because of the heightened competition for admission to the medical schools since the end of World War II, the schools have had an opportunity to be highly selective in accepting applicants for admission. They have been able to demand that all successful candidates present college records which clearly demonstrate a significant degree of scholastic ability. This fact is generally known and has given rise to serious misconceptions in many quarters concerning the qualifications that a college student must possess to gain admission to medical school. Thus statements have appeared in the public press from time to time to the effect that, unless a student maintains a straight "A" average in college, he has little or no chance of being admitted to a medical school. Such erroneous beliefs have magnified out of all proportion the problem of gaining admission to medical school. They are potentially dangerous in that their general acceptance could well discourage large groups of capable young men from considering the study of medicine. For this reason, information was sought from the medical schools this year as to the number of students in the freshman class that entered medical school in 1949 whose undergraduate college grade point averages were less than "B minus." Seventy-four of the 79 medical and basic science schools in the United States were able to provide this information. Of these schools 54, or 73 per cent, reported they had admitted students whose college grade point average was less than "B minus." The total number of such students in these 74 schools was 592, or 9.1 per cent, of the freshmen in the 74 schools reporting. The greatest number of students in this category admitted to any one school was 50. The median number was six. These figures should make clear how misleading is the belief that only straight "A" students can enter medical schools. While the majority of successful applicants to medical school average "B" or better in their undergraduate college courses, students with less favorable records do gain admission in appreciable numbers. It is recognized, of course, that students in this latter category must present other outstanding qualities of character, personality, aptitude and motivation that compensate for their relatively low academic standing.

Misconceptions are also prevalent concerning the ratio of applicants to the number of students accepted by the medical schools. In some quarters the belief is held that only one out of every 10 or 15 applicants to medical school is accepted. Official figures compiled by the Association of American Medical Colleges from data supplied by all medical schools in the United States reveal that 24,434 persons applied for admission to medical school in the United States for the 1949 freshman class. As already noted the number of students admitted to this class was 7,042. From these figures it can be computed that one out of every 3.47 applicants was successful in gaining admission. In evaluation of these figures, it should be pointed out that no special qualifications are necessary to apply for medical school and also that an unsuccessful applicant can reapply year after year. Any person with a desire to study medicine can file an application, regardless of his previous training or scholastic achievement. The experience of every medical school indicates that a very large number of those who apply for admission have no real qualifications other than the wish to study medicine. The gross total of applicants also contains an unknown number of persons who reapplied after having been rejected as unqualified in previous years. Thus, while no statistics are available, it may safely be concluded that the difference between the number of accepted students and

the number of qualified applicants who complete their undergraduate training each year is much smaller than would be indicated by the crude figures cited above.

Several public discussions during the past year have dealt anew with the recommendation that candidates for admission to medical schools acquire a broad educational background during their undergraduate college years. This subject was discussed at length in the 1948 Educational Number and is certain to be a topic of continuing interest in the future. While most medical schools recognize that, to make his full potential contribution to society, the physician requires a broad cultural background and an understanding of the many forces that shape the world in which he practices his profession, further discussion of this subject with student advisors in the undergraduate colleges will be highly beneficial. It is to be hoped that the studies and activities of the Survey Committee's Subcommittee on Preprofessional Education will make a major contribution in promoting a more mature philosophy of preprofessional education on the part of both medical schools and colleges.

The 1950 Freshman Class

The 1949 freshman class was the largest ever admitted to the medical schools of the United States. Figures submitted by the individual schools indicate that the 1950 freshman class will be even larger and will probably exceed 7,100 students to set a new record for freshman enrolments for the third successive year. By June of this year the schools had already selected 6,629 students. This group included 2,839 male veterans (42.8 per cent), 3,426 other men (51.7 per cent) and 364 women (5.5 per cent). Six of the women were veterans.

Plans of Medical Students for Future Practice

During the past year 31 classes in 19 medical schools were polled by their schools to determine the students' plans with respect to practice. Fourteen senior classes were polled. In eight schools, of the students who had made a tentative decision, the majority planned to do general practice, in five the majority planned to specialize and in one class the students were evenly divided between those who planned to do general practice and those who planned to specialize. The averages for the fourteen classes were as follows: 45.4 per cent intended to enter general practice and 41.3 per cent to specialize; 13.3 per cent were undecided.

Of the six junior classes polled, in five the majority of students planned to enter general practice and in the other the students were evenly divided. The averages for the six classes were as follows: 54.7 per cent planned to do general practice and 20.7 per cent to specialize; 24.6 per cent were undecided.

Polls of 11 freshman and sophomore classes revealed that in 10 classes, the majority of those having a definite preference planned to enter general practice. In only one class did the majority intend to specialize. The averages for the 11 classes were as follows: 45.6 per cent planned to enter general practice and 23.8 per cent to specialize; 30.6 per cent were undecided.

In summary of the 31 classes polled, in 23 classes the majority of students who had reached a decision planned to enter general practice, in six the majority planned to specialize and in two the students were evenly divided.

The over-all averages for the students in the 31 classes included in the study were as follows: 47.3 per cent planned to enter general practice and 31.1 per cent to specialize; 21.6 per cent were undecided. These findings, when studied in relation to the reports of similar studies in the last two Educational Numbers indicate that, over the three year period, the percentage of students planning to enter general practice has increased from 36 per cent to 47 per cent and the number planning to specialize has decreased from 36 per cent to 31.1 per cent.

Last year 42 schools reported that they had programs specifically designed to stimulate the interest of students in careers in general practice. This year information was sought as to the number of schools that have established preceptorships with practicing physicians as regular assignments in the medical school course. Thirteen schools report such preceptorships, nine having established them within the last two years. In six schools the preceptorship is a required assignment, while in the remaining seven it is voluntary or elective. In one school the preceptorship comes at the end of the second year, in two schools during the third year, in three schools between the third and fourth years and in the remaining seven schools in the fourth year. The duration of such preceptorship assignments varies from one week to three months. In all but two schools the assignment is of at least four weeks' duration. Reports from the schools having such programs reveal that 404 students served preceptorships during the year 1949-1950. Since in several schools the program was just initiated during the past academic year, it may be expected that the number of students following this assignment next year will be considerably increased.

The following schools have established preceptorships: California, Yale, Iowa, Kansas, Boston University, Nebraska, Duke, Oklahoma, New York University, Pennsylvania, University of Washington, Wisconsin and South Dakota. Four other schools report that they have programs of this type under consideration. In Canada, Manitoba and Dalhousie offer preceptorships with general practitioners.

Fifteen schools report that they are sponsoring in their affiliated hospitals, internships specifically designed for prospective general practitioners. These schools are Yale, George Washington, Indiana, Kansas, Louisville, Tulane, Tufts, Michigan, Nebraska, Albany, New York Medical College, Duke, Oklahoma, University of Virginia and Medical College of Virginia. Six other schools have programs of this type under consideration.

In Canada, Manitoba and Toronto offer internships for prospective general practitioners.

Twelve schools are sponsoring residencies in their affiliated hospitals for prospective general practitioners. These schools are Medical Evangelists, Southern California, Iowa, Kansas, Louisiana, Minnesota, Albany, Cincinnati, Oregon, Texas, Baylor and Marquette. Seven other schools have similar programs under consideration.

Vacancies on Instructional Staffs

Medical schools are still experiencing difficulty in finding qualified teachers to fill vacant or newly created positions on their instructional staffs. The number of schools reporting vacancies, however, and the total number of vacancies are smaller than those of last year.

All medical schools submitted information on the number of full time positions on their teaching staffs for the academic year 1950-1951 that they had been unable to fill up to June 1950. In the United States, 20 schools reported that they had no unfilled positions. Fifty-four

had a total of 175 unfilled positions in the preclinical departments. Thirty-two schools reported a total of 104 unfilled positions in the clinical departments. The number of unfilled positions are shown by departments in table 20.

Last year only 12 schools reported that they had no unfilled positions, and the total number of unfilled full time positions was 441, of which 240 were in the preclinical departments and 201 in the clinical departments.

In Canada six medical schools reported no unfilled positions, four schools reported a total of seven unfilled positions, two in biochemistry and one each in anatomy, microbiology, physiology, pharmacology and public health.

Major Developments in the Medical Schools

Each medical school was asked to describe briefly major new developments during the past year that might be of general interest. The developments that were reported may be summarized under the headings of curriculum, organization and administration, institutional affiliations, construction and planning and miscellaneous. While it is beyond the scope of this review to report in detail all of the information submitted by the medical schools and while information is lacking for some schools, the summary that follows does indicate the trend of developments among the medical schools in the United States.

TABLE 20.—*Total Number of Unfilled Full Time Positions by Departments in the Medical and Basic Science Schools of the United States for 1950-1951*

	Number of Unfilled Positions
Preclinical Departments	
Anatomy	40
Pathology	34
Biochemistry	23
Microbiology	24
Physiology	21
Pharmacology	16
Physiology and Pharmacology	11
Biophysics	1
Total	175
Clinical Departments	
Internal Medicine	18
Psychiatry	16
Preventive Medicine and Public Health	15
Pediatrics	13
Surgery	13
Obstetrics and Gynecology	9
Radiology	6
Anesthesiology	5
Physical Medicine	3
Orthopedic Surgery	2
Ophthalmology	2
Neurology	1
Neurosurgery	1
Total	104
Grand Total	279

Thirteen schools reported that major changes had been instituted in the curriculum of one or more years. These schools included Stanford, Georgetown, Stritch, Maryland, St. Louis, Pittsburgh, Woman's, South Carolina, Virginia, Creighton, New York Medical, Rochester and Pennsylvania. Almost all reported that the objective in reorganizing the curriculum was to increase the time spent in clerkships and to reduce the amount of didactic instruction in the clinical years. Several schools in addition mentioned that the curricular revision was designed to make possible the earlier introduction of the study of clinical subjects in the medical school course and to promote closer correlation or integration of the clinical subjects with each other or with the basic medical sciences. Four schools (St. Louis, Woman's, New York Medical and Pennsylvania) lengthened the academic year to provide more instruction in the clinical subjects. At Pennsylvania several new courses were introduced and established courses modified with the aim of emphasizing social and environmental medicine and interest in the patient as a person. One of the new courses instituted is an elective assignment to a Family Health Advisor Service extending throughout the four years.

A highly significant development in the field of curricular study was the receipt of a grant by Western Reserve from the Commonwealth Fund to finance a five year fundamental study of the medical curriculum with a view to appraising the content of the curriculum, instructional methods and the correlation and integration of all aspects of the teaching of medicine.

Under the heading of organization and administration the commonest changes were with respect to the departments of Public Health and Preventive Medicine. The following schools either organized such departments as independent units for the first time or completely reorganized existing departments: Temple, Pennsylvania, Virginia and Illinois. Oklahoma organized a division of postgraduate instruction with five full time faculty members.

The following important new hospital affiliations were announced: At Louisville a university medical center was formed during the past year through a cooperative agreement entered into by the medical school, the Louisville General Hospital, the Children's Hospital, the Jewish Hospital and several other institutions. Oklahoma established a formal affiliation with the Oklahoma Medical Research Foundation. Pittsburgh assumed responsibility for the operation of the Western State Psychiatric Institute and Clinic. New York Medical established affiliations with Morrisania and Seton hospitals, Creighton with St. Elizabeth's Hospital in Lincoln, Neb., and Stritch reinstituted a close affiliation with Mercy Hospital in Chicago.

The number of schools reporting new construction and plans for new construction and the number of individual projects involved were so numerous that it is not possible even to list all the projects individually in the space available.

The following schools reported that new medical school buildings proper or major additions to their existing buildings were under construction or were completed during the past year: Alabama, California at San Francisco, Emory, Cincinnati, Minnesota, Oregon, Tennessee, South Carolina, Albany, Rochester, North Dakota, Pittsburgh, Pennsylvania, North Carolina and the University of Washington, Seattle.

The following schools carried out extensive remodeling or renovations of their existing medical school buildings or of older buildings recently acquired: Stanford, Indiana, Oregon, Utah, Louisville, Maryland, State University College of Medicine at New York City and Ohio State.

The following schools either constructed or were in the process of constructing cancer research units: Colorado, Columbia, Washington University at St. Louis, Rochester, Tennessee and Utah.

The following schools reported the building of new animal quarters or major expansion of existing quar-

ters: Georgetown, Boston University, Oklahoma, Mississippi and Oregon. In several instances the construction was part of the school's cancer research program.

Additions to existing clinical facilities or the construction of new clinical facilities owned and operated by the schools were reported by the following medical schools: California at San Francisco, Colorado, Illinois, Indiana, Oklahoma, Oregon, Pennsylvania, Vermont, Maryland, Michigan, Washington University at St. Louis, New York University, Ohio State and Pittsburgh.

The University of Southern California has purchased two blocks adjacent to the Los Angeles County Hospital for the development of a medical center. The school has received $350,000 endowment for the center. At Utah the regents set aside a 100 acre tract for the long range development of a campus medical center.

The following schools, in addition to projects that may be listed above, have indicated that they are in the process of planning for the early construction of various units for which funds are available: Arkansas, University of Southern California, Colorado, George Washington, Stritch, Indiana, Tulane, Oregon, Temple, Pittsburgh, Woman's, South Carolina, South Dakota, Virginia and Mississippi.

Figures as to actual or expected cost were submitted for only half of the projects listed above. The figures that were supplied totaled slightly more than $100,000,000.

Among the miscellaneous developments that were reported, the following appeared to be of most general interest. Indiana reported that $1,000,000 had been raised by the Riley Memorial Association for the continued support of the new children's research unit. Rochester received a gift of $2,000,000 in endowment for research. Minnesota received endowments totaling $575,000 for medical research and for a research professorship in ophthalmology. New York Medical reported receiving a total of $750,000 in special endowments for the departments of surgery and obstetrics and gynecology. Stanford received endowment funds to establish 10 graduate fellowships.

Boston University received a grant from the Commonwealth Fund for the expansion and extension of its domiciliary care program as part of the third and fourth year curriculum. Louisville received a grant from the Commonwealth Fund to institute a program of preventive mental hygiene in pediatrics, and Utah entered into a cooperative project with the State Department of Public Health for a state child guidance and mental hygiene program.

Financial Support of Medical Schools

The budgets of the medical and basic science schools in the United States for the academic year 1950-1951 total approximately $67,500,000. This sum represents a gross increase of $6,500,000 over the figures reported for the previous year. Changes in the methods of reporting their budgets by four schools and the addition of one new school to the number reporting last year account for approximately $1,500,000 of this increase. The remaining $5,000,000 represents the approximate net increase over the total budgets for 1949-1950. After appropriate corrections have been made for changes by some schools in the method of reporting their budgets during the period involved, it can be calculated that the total budgets for the year 1950-1951 for those schools that were included in the 1947 Educational Number have been increased by $19,500,000, or 42.4 per cent, over the total budgets available to those schools for the year 1947-1948.

This year's figures include the cost of plant maintenance for all but three schools and the cost of operating the library for all but two schools. All those schools which carry a charge for general university administration in their budgets were able to subtract this item this year, so that their figures could be compared with those from the schools which do not carry such charges. Charges for general university administration are not included in the total of $67,500,000.

The figure $67,500,000 also does not include grants for research or for special teaching projects from outside agencies or any significant portion of the cost of operating the teaching hospitals affiliated with the medical schools. It does include a total of approximately $2,900,000 that the medical schools will spend to support certain activities in their affiliated hospitals. This sum is largely made up of salaries of professional and technical personnel on hospital staffs, the cost of operating special laboratories and in a few instances contributions to the operating budgets of hospitals and dispensaries used by the medical school for teaching purposes.

As in previous years, the total of $67,500,000 that it will cost to operate the medical schools during the coming year does not include the direct and frequently substantial contributions that a number of teaching hospitals make to the educational programs of their affiliated schools, nor does it include the value of the services contributed by the unpaid members of the teaching staff who in a number of schools are still responsible for a major part of the instruction, especially in the clinical departments.

It has already been noted under the section on major developments in the medical schools that the schools during the past year were engaged in constructing new facilities of various types and that the cost of only one half of these projects totaled more than $100,000,000.

Receipts from tuition fees during the coming year will total $15,200,000, or 22.5 per cent of the budgets of the medical schools. Last year tuition fees provided $13,900,000, or 22.8 per cent of the budgets, while in 1948-1949 tuition fees provided $12,800,000, or 25 per cent of the budgets of the schools. The number of schools unable to match student fees dollar for dollar with funds from nonstudent sources will increase from seven to eight during the coming year.

Twenty-four medical schools report budgets of over $1,000,000 for the coming academic year. Three of these schools will have budgets of over $2,000,000. Thirteen of the four year schools report budgets of less than $500,000. Last year 17 schools reported budgets of more than $1,000,000, of which four had budgets exceeding $2,000,000 and 16 schools budgets of less than $500,000.

The schools have estimated that, during the academic year 1950-1951, they will receive from outside agencies a total of $26,250,000 in grants for research and $4,000,000 in grants for special teaching activities. Last year funds received in these categories totaled $23,600,000 and $3,800,000, respectively. All schools

are receiving funds in both categories. Among the four year schools, the range in grants for research varied from $11,000 to $1,740,000. Five schools received more than $1,000,000 each in grants for research, and 12 other schools received between $500,000 and $1,000,000. Among the four year schools special grants for teaching ranged from $15,000 to $175,000.

For the reason cited in the section on the responsibilities of medical schools for other students the calculation of the range of expenditures per student by the medical schools that has been included in previous reports is being discontinued this year.

Twenty-six schools reported that the prospect of receiving adequate financial support from local sources is more favorable at present than a year ago. Thirty-six stated the belief that the situation is unchanged and 14 that prospects are less favorable. Three schools did not offer an opinion.

In last year's Educational Number reference was made to the joint activity of several groups interested in medical education in exploring the possibility of establishing an organization to secure funds on a national scale from voluntary sources for the support of the medical schools. The opinion was expressed that an announcement concerning the formation of such an organization might be forthcoming in the ensuing months. While the expected announcement has not been made, interest in such an organization has continued to grow, and it now seems probable that an announcement to the effect that such an organization has been formed will be made in the not too distant future.

TABLE 21.—*Range of Annual Fees in Medical and Basic Science Schools in the United States and Canada, 1950-1951*

	Number of Schools		Number of Schools
Less than $100	1	$500 to 599	8
$100 to 199	3	600 to 699	13
200 to 299	8	700 to 799	15
300 to 399	15	800 to 899	12
400 to 499	14		
Total			89

Reference was also made in the last report to the fact that several bills have been introduced into Congress to provide federal support for the medical schools. One bill, S. 1453, was passed by the Senate in the fall of 1949. A companion bill had not been acted on by the House of Representatives at the time this report was written.

Fees

Resident tuition fees in the 72 medical schools and the seven schools of the basic medical sciences in the United States for the academic year 1950-1951 will range from $97 to $867. The median fee will be $600, as compared with $577 in the previous year. The average fee will be $554, as compared with $548 for 1949-1950.

The average tuition fee now stands at 148 per cent of the average tuition fee in 1939-1940, which was $378. Despite this increase, tuition fees, as pointed out in the preceding section, will provide only 22.5 per cent of the cost of operating the medical schools during the forthcoming year.

In table 21 the 89 medical schools and schools of the basic medical sciences in the United States and Canada have been arranged in groups according to the tuition fees that will be charged resident students for the session 1950-1951. The figures in this table represent one fourth of the total tuition fee charged for the four years of the medical school course, including minor charges such as those for matriculation, breakage, diploma and graduation. Thirty-four schools in the United States make an additional charge for nonresident students. In 33 of these schools the range of such charges is from $63 to $420. One school charges nonresident students an additional fee of $2,140.

Cost of Attending Medical School

No studies have been made in recent years of the cost to medical students of attending medical school. The medical schools were asked this year to estimate the minimum and average financial outlays experienced by their students during one academic year for tuition, other fees, books, equipment, travel and all essential living costs. Seventy-six schools in the United States provided estimates as to the minimum cost. These estimates ranged from $567 to $2,252, with a median of $1,473.

Seventy-four medical schools in the United States submitted estimates as to the average cost of attending medical school. These estimates ranged from $800 to $2,500, with a median of $1,800.

Five medical schools estimated the minimum cost of attending medical school to be $2,000 or more, and 21 schools estimated it to be $1,200 or less. Seventeen schools estimated the average cost at $2,000 or more per year and 26 schools at $1,500 or less per year.

In Canada, the minimum cost of attending medical school for one year ranged from $900 to $1,500, with a median of $1,200. The average cost ranged from $1,000 to $2,000, with a median of $1,300.

Private and Governmental Medical Schools

In table 22 the medical schools in the United States are listed according to the nature of their ownership during the academic year 1949-1950. As already pointed out, with the passing of three schools, Syracuse, Long Island and Southwestern, from private to state ownership, the number of schools owned by private nonprofit organizations decreased from 44 in the preceding year to 41. The number of state-owned schools was further increased by the addition of the University of Washington. In summary, during the past academic year 41 schools were owned by private corporations which in all cases were nonprofit organizations, exempt from federal income taxation; 35 schools were owned by states and three by municipal governments.

Enrolments in the private schools during 1949-1950 numbered 13,781, or 54.9 per cent of the total for the country. The enrolment in the governmental schools was 11,322, or 45.1 per cent.

The freshman classes in the private schools totaled 3,689 and in the governmental schools 3,353, or 52.4 per cent and 47.6 per cent, respectively. The private schools graduated 3,143 physicians, or 56.6 per cent of the total for the year, and the governmental schools 2,410, or 43.4 per cent.

Statistics with respect to the enrolment of resident and nonresident students by the governmental and private schools have already been presented in the section on the geographic source of freshman students.

The budget for the governmental schools for 1950-1951 will total approximately $31,000,000 and for the private schools approximately $36,500,000.

TABLE 22.—*Medical Schools Classified by Ownership, 1949-1950*

Privately Owned

College of Medical Evangelists (Calif.)
Stanford University School of Medicine
University of Southern California School of Medicine
Yale University School of Medicine (Conn.)
Georgetown University School of Medicine
George Washington University School of Medicine (D. C.)
Howard University College of Medicine
Emory University School of Medicine (Ga.)
Chicago Medical School (Ill.)
Northwestern University Medical School
Stritch School of Medicine of Loyola University
University of Chicago, The School of Medicine
Tulane University of Louisiana School of Medicine (La.)
John Hopkins University School of Medicine (Md.)
Boston University School of Medicine (Mass.)
Harvard Medical School
Tufts College Medical School
St. Louis University School of Medicine (Mo.)
Washington University School of Medicine
Creighton University School of Medicine (Nebr.)
Dartmouth Medical School (N. H.)
Albany Medical College (N. Y.)
Columbia University College of Physicians and Surgeons
Cornell University Medical College
New York Medical College, Flower and Fifth Avenue Hospitals
New York University College of Medicine
University of Buffalo School of Medicine
University of Rochester School of Medicine and Dentistry
Duke University School of Medicine (N. C.)
Bowman Gray School of Medicine of Wake Forest College
Western Reserve University School of Medicine (Ohio)
Hahnemann Medical College and Hospital of Philadelphia (Pa.)
Jefferson Medical College of Philadelphia
Temple University School of Medicine
University of Pennsylvania School of Medicine
University of Pittsburgh School of Medicine
Woman's Medical College of Pennsylvania
Meharry Medical College (Tenn.)
Vanderbilt University School of Medicine
Baylor University College of Medicine (Tex.)
Marquette University School of Medicine (Wis.)

State Owned

Medical College of Alabama
University of Arkansas School of Medicine
University of California School of Medicine
University of Colorado School of Medicine
Medical College of Georgia
University of Illinois College of Medicine
Indiana University School of Medicine
State University of Iowa College of Medicine
University of Kansas School of Medicine
Louisiana State University School of Medicine
University of Maryland School of Medicine
University of Michigan Medical School
University of Minnesota Medical School
University of Mississippi School of Medicine
University of Missouri School of Medicine
University of Nebraska College of Medicine
State University of New York, State University Medical Center at New York City, College of Medicine
State University of New York, Medical Center at Syracuse University, School of Medicine
University of North Carolina School of Medicine
University of North Dakota School of Medicine
Ohio State University College of Medicine
University of Oklahoma School of Medicine
University of Oregon Medical School
Medical College of the State of South Carolina
University of South Dakota School of Medical Sciences
University of Tennessee College of Medicine
Southwestern Medical School of the University of Texas
University of Texas School of Medicine
University of Utah School of Medicine
University of Vermont College of Medicine
Medical College of Virginia
University of Virginia Department of Medicine
University of Washington School of Medicine
West Virginia University School of Medicine
University of Wisconsin Medical School

Municipally Owned

University of Louisville School of Medicine (Ky.)
Wayne University College of Medicine (Mich.)
University of Cincinnati College of Medicine (Ohio)

Resident tuition fees in the governmental schools for 1950-1951 will range from $97 to $803, with a median of $386. For the private schools tuition fees will range from $390 to $867, with a median of $741.

New Medical Schools

Definite progress in the establishment of new medical schools or in the expansion of schools of the basic medical sciences to a full four year program was recorded in several states during the past year.

At the University of California in Los Angeles, ground was broken for the construction of the medical school plant. This school now expects to open in the fall of 1953.

The University of North Carolina School of Medicine began the construction of a university hospital in October 1949 and before the end of 1950 expects to let contracts for a new wing to the medical school building and for other facilities. It is anticipated that the construction will be completed by the end of 1951, that the hospital will be in operation by 1952 and that the first third year class will be accepted in 1953.

The 1950 session of the Mississippi State Legislature appropriated $4,000,000 to build and equip a medical science building in Jackson for a four year school of medicine. Plans for the building are now being prepared.

In New Jersey the committee appointed by the governor in 1949 to study the problem of establishing a medical school as a department of the State University of Rutgers recommended that a medical school be established. In May 1950 the governor signed legislation creating a commission to plan the establishment of a medical college. This commission is to make a report to the governor and the legislature not later than Feb. 1, 1951.

In West Virginia, the Interim Committee authorized by the legislature in 1949 to study the entire problem of medical education in that state has sponsored several studies and surveys and will make a report to the legislature when it meets in January 1951.

In last year's Educational Number, it was reported that the 1949 Florida Legislature passed an act authorizing the establishment of a medical school as a part of the University of Florida at Gainesville but that no funds had as yet been appropriated. Further studies relating to the establishment of a medical school are being made by various state agencies.

The medical school of the University of Puerto Rico, established during the past year, has taken over the physical plant of the School of Tropical Medicine and will admit its first class this fall.

The possibility of expanding to a four year program is still under study by the basic science schools of North Dakota and Missouri, but no decisions have been made.

Foreign Medical Schools

During the past decade the need for the development of a list of foreign medical schools for the guidance of individuals and medical institutions and organizations in the United States has become increasingly apparent. Careful study of this problem was initiated by the Council immediately after the war, and a Committee on Foreign Medical Credentials consisting of representatives from 19 private and governmental agencies concerned with medical education, licensure and the

problems of foreign physicians was established as an advisory group to the Council. This Committee recognized that the Council and the Association of American Medical Colleges were not in a position to carry out periodic, thorough surveys of the more than 300 medical schools in other parts of the world similar to those made in evaluating American and Canadian schools. The committee was of the opinion, however, that the Council in collaboration with the Association of American Medical Colleges could obtain through various reliable sources sufficient information to permit them to prepare a list of foreign medical schools whose graduates they could recommend for consideration on the same basis as graduates of approved medical schools in the United States. The committee recommended that a preliminary list of such schools be issued at the earliest possible date and that it be supplemented from time to time as rapidly as information could be compiled for other schools.

In February 1950 the Council and the Executive Council of the Association of American Medical Colleges published the first such list of foreign medical schools, containing the names of 38 medical schools in six countries. In July 1950, six additional schools in two other countries were added to this list.

In table 23 are listed those foreign medical schools presently listed by the two Councils. The preamble to the official list of foreign schools issued by these two organizations contains the following statement: "On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This list is not final and will be supplemented as information is compiled for other schools."

Because this list is a preliminary one, the position of the Council and the Executive Council with respect to schools not on this list is that they neither approve nor disapprove these schools but must leave to the judgment of individual institutions and organizations in the United States the decision as to whether they will accept graduates of schools not on this list on the same basis that they accept graduates of approved medical schools in the United States.

TABLE 23.—*Foreign Medical Schools*[1]

Denmark

University of Copenhagen Faculty of Medicine
(Køpenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Kakulteten)
Medical Faculty Turku University
(Turum Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)
State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Medische Faculteit)
State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)
State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

Norway

University of Oslo Faculty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)
Charles Medico-Surgical Institute, Stockholm
(Karolinska Mediko-Kirurgiska Institutet)
Royal University of Uppsala Medical Faculty
(Kungl. Universitetet i Uppsala Medicinska Fakulteten)

Switzerland

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss Federal Diploma issued by the Federal Department of the Interior (Eidgendoissisches Departement Des Innern, Departement Federal de L'Interieur) and obtainable only by Swiss citizens, or who hold the Certificate of Medical Studies, (Akademische Zeugnis, Certificat d'Etudes Medicales) which is issued by the Departments of Education of the cantonal government and which is awarded to those not citizens of Switzerland who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma.

The recommendation does not apply to those holding only the M.D. degree from Swiss universities or those who have taken only faculty examinations and hold certificates other than the Swiss Federal Diploma or its equivalents: the Akademische Zeugnis or Certificat d'Etudes Medicales. The M.D. degree in Switzerland is frequently awarded on the basis of a thesis written during as little as one year in residence. Faculty diplomas may be issued to students who have not completed the full course of study and who have not passed the examinations required for the Swiss Federal Diploma or its equivalents.

Officials of State Boards and of other organizations who are in doubt as to the nature of credentials presented by individual graduates of Swiss schools are urged to communicate with the Director of the Schweizerisches Gesundheitsamt, Bern, Switzerland.

University of Basel Faculty of Medicine
(Universität Basel Medzinische Fakultät)
University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)
University of Geneve Faculty of Medicine
(Université de Genève Faculté de Medecine)
University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Medecine)
University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

United Kingdom

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who did not complete the work for the degree and who obtained their qualifications only through the examinations of the licensing corporations of the United Kingdom.

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London †
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee

Wales

Welsh National School of Medicine, University of Wales, Cardiff

† Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School
Guy's Hospital Medical School
King's College Hospital Medical School
London Hospital Medical School
Middlesex Hospital Medical School
Royal Free Hospital School of Medicine
St. Bartholomew's Hospital Medical College
St. George's Hospital Medical School
St. Mary's Hospital Medical School
St. Thomas' Hospital Medical School
University College Hospital Medical School
Westminster Hospital Medical School

1. List prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges.

POSTGRADUATE AND CONTINUATION COURSES FOR PHYSICIANS

Since 1937 the Council on Medical Education and Hospitals has published semiannually in THE JOURNAL lists of postgraduate and continuation courses for physicians. The opportunities presented in these listings include a wide variety of fields in clinical medicine and the basic sciences. The courses are for variable periods from one day to a year or longer. Some are concentrated full time courses and others are part time. With the exception of the formal basic science courses, these courses are not usually intended to prepare physicians for certification by the American boards in the specialties. Some opportunities are offered, however, for review work in preparation for the examinations of the specialty boards.

The listing of courses currently available was published in the June 10, 1950 issue of THE JOURNAL and is available in reprint form. Medical schools, state medical societies, hospitals, state and city boards of health and special societies continue to be active in developing this type of continuation training. Institutions offering this type of training are invited to announce such courses in the Council's semiannual listing.

This section is devoted to an analysis of the courses offered during the period July 1, 1949 to June 30, 1950. Brief mention is also made of some of the recent developments in postgraduate education. The statistical summaries are divided into three groups: short review courses of less than five days, courses of five days' duration or longer and, lastly, a group including clinical conferences, graduate assemblies, study courses and courses of a chautauqua nature. Comparable figures are also shown for the preceding four years.

Recent Developments

A five year postgraduate education program has been launched by the Minnesota Department of Health to bring to different areas of the state the latest developments in the treatment, diagnosis and management of heart disease, cancer and psychosomatic medicine. The seminars are held for eight consecutive weekly sessions. Each session covers approximately two hours. Lecturers for the most part are supplied by the faculty of the University of Minnesota Medical School.

A series of courses on both basic science and clinical subjects is offered by the Essex County Medical Society of New Jersey. The length of these courses varies from five sessions to periods of 30 weeks. They are given at Seton Hall College, Newark City Hospital and the Newark Eye and Ear Infirmary.

The University of Cincinnati College of Medicine and the Society of General Physicians of Ohio is arranging a seminar series for general physicians. The postgraduate committee has mailed a questionnaire to physicians of the state in an endeavor to select the subjects and time most desirable.

A postgraduate symposium on general surgery and the surgical specialties was held at the University of Arkansas School of Medicine under the sponsorship of the Arkansas Academy of General Practice and the state medical society. The symposium was presented by the members of the departments of surgery, anesthesiology and radiology of the medical school. The symposium, extending over three days, consisted of formal presentations, case clinics and questions and discussion periods.

The University of Illinois College of Medicine will offer a course in allergy beginning in October and extending over a period of a year. The course will carry credit for one year toward the formal training requirements of either the American Board of Internal Medicine or of the American Board of Dermatology and Syphilology. Enrolment is limited to six students.

A 10 weeks' course in physical medicine and rehabilitation was given at the Veterans Administration Hospital, Hines, Ill., for physicians from other Veterans Administration hospitals throughout the country.

The Massachusetts Department of Mental Health is sponsoring a seminar extending from October 6 to May 11, 1951 which will consist of three separate courses running concurrently and covering a review of basic neurology and psychiatry, a series of 63 lectures in clinical psychology and dynamic psychiatry and 20 lectures in pediatric neuropsychiatry.

Several courses of eight months each have been added to the opportunities available at the University of Pennsylvania Graduate School of Medicine, including gastroenterology, plastic surgery, oral medicine, oral roentgenology, prosthetics and specially arranged courses in the basic medical sciences. A one week course entitled "Current Events in Medicine and Surgery" is to be given September 25-29.

TABLE 24.—*Postgraduate Courses of Less Than Five Days' Duration, 1949-1950*

State Where Given	No. of Courses	State Where Given	No. of Courses
Alabama	6	Massachusetts	6
California	17	Michigan	6
Colorado	9	Minnesota	19
Connecticut	4	Mississippi	4
District of Columbia	1	Missouri	1
Florida	2	Nebraska	2
Georgia	1	New York	38
Illinois	1	North Carolina	1
Indiana	6	Ohio	4
Iowa	6	Oregon	1
Kansas	9	Texas	6
Kentucky	8	Virginia	1
Louisiana	1	Wisconsin	1
Total			161

The American College of Chest Physicians and the Laennec Society of Philadelphia sponsored a one week course emphasizing recent developments in the diagnosis and treatment of diseases of the chest. The course was open to all physicians, although the number of registrants was limited.

A combined course in obstetrics and pediatrics designed for general practitioners was given by the Division of Postgraduate Medical Education of the University of Washington School of Medicine at Seattle. Physicians were permitted to register for either the two and one-half day session in obstetrics or pediatrics or for the complete five day course.

Analysis of Courses Offered 1949-1950

Courses of Less Than Five Days' Duration.—During 1949-1950 twenty-five states and the District of Columbia provided opportunities of less than five days' duration for physicians desiring to continue professional study in or near their home communities. Table 24 lists these states and the number of courses given in each state. Twenty-eight subjects as listed in table 25 were covered in these courses. Table 25 also shows the attendance recorded by courses. A

total of 161 courses with an attendance of 10,523 was reported. The courses in ophthalmology and neurology and psychiatry proved to be the most popular, with attendances of 2,819 and 1,247, respectively. The greatest number of courses were offered in general medicine and in neurology and psychiatry.

TABLE 25.—*Postgraduate Courses of Less Than Five Days' Duration, 1949-1950*

Specialty	No. of Courses Given	Attendance
Arthritis	1	77
Anesthesiology	3	57
Cardiovascular Disease	8	339
Dermatology and Syphilology	2	98
Diabetes	1	33
Electrocardiography	4	94
Forensic Medicine	3	124
Fractures	1	312
Gastroenterology	1	91
Hematology	3	71
Internal Medicine	4	155
Malignant Disease	7	633
Medicine, General	26	371
Neurology and Psychiatry	43	1,247
Nuclear Science	1	275
Obstetrics and Gynecology	10	603
Oncology	2	217
Ophthalmology	3	2,819
Orthopedic Surgery	3	44
Otorhinolaryngology	2	104
Pediatrics	10	367
Poliomyelitis	3	196
Public Health	1	28
Pulmonary Diseases	4	798
Radiology	4	695
Surgery	6	395
Therapy	3	149
Urology	2	131
Totals	161	10,523

The programs varied in length from sessions of one and one-half hours to four and one-half days full time and consisted of organized courses, clinics utilizing hospital patients, lectures and demonstrations with emphasis on a review of medical progress and recent developments. Full time courses included 22 of four days', 63 of three days', 29 of two days' and 10 of one day's duration. The remainder of the opportunities were reported by sessions or hours. The instructors were chosen from the faculties of medical schools and from

TABLE 26.—*Postgraduate Courses of Five or More Days, 1949-1950*

State Where Given	No. of Courses	State Where Given	No. of Courses
Arkansas	2	Michigan	51
California	69	Minnesota	6
Colorado	3	Mississippi	3
Connecticut	13	Missouri	11
District of Columbia	11	New Jersey	28
Florida	6	New York	461
Georgia	14	North Carolina	6
Illinois	206	Ohio	7
Indiana	1	Oregon	14
Iowa	2	Pennsylvania	43
Kansas	5	South Dakota	1
Kentucky	3	Tennessee	7
Louisiana	14	Texas	13
Maine	1	Virginia	1
Maryland	10	Wisconsin	6
Massachusetts	68		
Total			1,080

physicians practicing in the state in which the courses were offered as well as from out of the state. Medical school faculties participated in 67 instances. The facilities used included hospitals, clinics, medical schools and hotels and also combination of these facilities. Sponsoring agencies included 24 medical schools, one county and 5 state medical societies and 4 state boards of health.

These offerings were held during every month except August, the majority being given in February, March and October. Fees ranged from $2 to $96. The majority were less than $50. In 15 instances no fee was charged.

While these opportunities continue to meet certain needs, they are proving to be less popular than the more concentrated courses of five days' duration or longer.

Courses of Five Days' Duration or Longer.—In centers where ample clinical facilities are available, 1,080 graduate courses of five days' duration or longer were offered in 30 states and the District of Columbia. These states and the number of courses which were given in

TABLE 27.—*Postgraduate Courses of Five or More Days, 1949-1950*

Specialty	No. of Courses Given	Attendance
Allergy	19	280
Anatomy	88	721
Arthritis	5	49
Anesthesiology	25	313
Bacteriology	12	284
Basic Sciences	12	656
Biochemistry	4	70
Cardiovascular Disease	43	1,604
Dermatology and Syphilology	22	380
Diabetes	6	79
Electrocardiography	39	1,289
Electroencephalography	6	26
Endocrinology	24	512
Endoscopy	29	158
Forensic Medicine	1	1
Fractures	8	144
Gastroenterology	30	425
Geriatrics	2	8
Hematology	19	329
Immunology	1	9
Industrial Medicine	5	26
Internal Medicine	42	1,349
Malignant Disease	5	349
Medicine, General	59	2,061
Neurology and Psychiatry	64	1,634
Nuclear Science	10	81
Nutrition	3	18
Obstetrics and Gynecology	103	2,308
Ophthalmology	71	1,912
Orthopedic Surgery	15	124
Otolaryngology	18	177
Otology	1	9
Otorhinolaryngology	3	58
Pathology	42	464
Pediatrics	50	967
Pharmacology	3	16
Physical Medicine	17	51
Physiological Chemistry	2	9
Physiology	8	143
Plastic Surgery	5	76
Poliomyelitis	13	193
Proctology	18	202
Public Health	21	447
Pulmonary Diseases	21	668
Radiology	41	632
Surgery	76	1,797
Therapy	3	28
Tropical Medicine	1	15
Urology	20	265
Venereal Disease	4	81
Totals	1,080	24,087

each state are recorded in table 26. The greatest number of courses offered were in Illinois and New York.

The 1,080 programs consisted of refresher courses of five or more days to intensive courses extending over one year. Courses in 50 subjects were given. Table 27 lists the subjects covered, the number of courses in each subject and the total attendance for the courses in each subject. In this type of training more than 2,000 physicians attended courses in both general medicine and obstetrics and gynecology and over 1,000 took courses in cardiovascular disease, electrocardiography, internal medicine, neurology and psychiatry, ophthalmology and surgery.

In 221 instances courses of five days' duration were offered. There were 246 courses given which were of more than five days' duration but less than one month

and 447 courses that ranged in length from one to three months. The length of the balance of the courses was as follows:

Months	No. of Courses
3	28
4	16
5	5
6	11
7	5
8	26
9	23
10	3
Years	
1	31
1½	1
3	3
Time Arranged	14
	166

Information submitted concerning the type of instruction offered indicated that 40 were clinical courses, 177 were didactic, 654 were both clinical and didactic, 33 were laboratory and didactic and 176 did not specify the type of instruction.

The reported attendance for the 1,080 courses given was 24,087. There were 47 courses reported canceled.

Clinical Conferences, Graduate Assemblies, Study Courses and Chautauqua Courses.—In 25 states and the District of Columbia, 129 clinical conferences, graduate assemblies, study courses and chautauqua courses were held during 1949-1950. This type of training varied in length from one day sessions to two weeks. In five states, chautauqua courses were held at various times in four to 20 centers. One correspondence course was given. The majority of the opportunities afforded were in general medicine. Other subjects covered were cardiovascular disease, electrocardiography, endocrinology, hematology, industrial medicine, internal medicine, malignant disease, neurology and psychiatry, obstetrics and gynecology, ophthalmology and surgery. Contributing agencies were speakers' bureaus of state medical societies, medical schools, county medical societies, state health departments and special medical societies. The facilities of hospitals, clinics, medical

TABLE 28.—*Postgraduate Courses Offered and Attendance, 1945-1950*

	Less Than Five Days' Duration			Five or More Days			Clinical Conferences, Graduate Assemblies, Study and Chautauqua Courses			Total		
	Total Courses	Number Reporting Attendance	Attendance	Total Courses	Number Reporting Attendance	Attendance	Total Courses	Number Reporting Attendance	Attendance	Total Courses	Number Reporting Attendance	Attendance
1945-1946	154	128	4,140	1,070	1,043	19,991	52	52	21,824	1,276	1,223	45,955
1946-1947	229	205	16,274	1,291	1,137	23,062	21	21	20,475	1,551	1,363	59,811
1947-1948	406	478	31,569	1,279	1,183	24,878	25	25	26,350	1,800	1,686	82,806
1948-1949	304	282	16,821	1,074	984	28,507	67	67	38,058	1,445	1,313	83,386
1949-1950	161	161	10,523	1,080	1,080	24,087	129	129	40,708	1,370	1,370	75,318
Totals	1,354	1,234	79,227	5,794	5,427	120,525	294	294	147,421	7,442	6,955	347,273

Medical school facilities were used for 789 courses, hospitals for 179, clinics for 13 and hotels or other facilities for 19. In many of these courses two or more of these facilities were used. The facilities used for the remaining courses were not specified. The faculties of medical schools served as instructors in 721 courses.

One hundred and five agencies participated in sponsoring these courses, including 47 medical schools, 16 special medical societies, 12 hospitals, 9 health departments, 6 state medical societies, 5 county medical societies, 4 graduate schools of medicine and 2 government agencies.

Courses were offered during every month from July 1949 through June 1950. In 56 instances they were arranged to suit the convenience of the participants, while 34 courses were offered continuously. There were 157 courses available for specialists only, 534 for nonspecialists and 389 were designed for both specialists and nonspecialists. The fees charged varied from $5 to $1,000. In 29 instances no fee was charged.

schools and hotels were used. Instruction was both didactic and clinical. Instructors included medical school faculties and physicians practicing in the state in which the training was given as well as from out of the state. Courses were given during every month last year. The fees ranged from $5 to $25. In the majority of instances no fee was charged. The attendance numbered 40,708.

Summary.—In 32 states and the District of Columbia some form of postgraduate continuation study for practicing physicians was provided during 1949-1950. Table 28 summarizes for these three groups the number of courses given, the number for which attendance was reported and the total attendance together with comparable figures for the four previous years. The total attendance for all three groups last year was 75,318. While this figure represents a decrease of about 8,000 as compared with two previous years, it is clear that this type of training continues to be in heavy demand by the medical profession.

INTERNSHIPS AND RESIDENCIES

The following internship and residency training programs have been approved since the publication of the list of Approved Residencies and Fellowships in THE JOURNAL, April 15, 1950. A number of hospitals not included in this list have recently been surveyed by representatives of the Council and have been recommended for residency approval. These hospitals will be notified as soon as final action on their applications has been completed.

Information regarding these hospitals will appear in the next Internship and Residency Number of THE JOURNAL.

ADDITIONAL INTERNSHIPS APPROVED

U. S. Naval Hospital	Charleston, S. C.
Veterans Admin. Hospital	Oklahoma City, Okla.
Veterans Admin. Hospital	McKinney, Texas
St. Vincent Hospital	Little Rock, Ark.
Long Beach Community Hospital	Long Beach, Calif.
St. Mary's Long Beach Hospital	Long Beach, Calif.
Methodist Hospital of Southern California	Los Angeles, Calif.
General Rose Memorial Hospital	Denver, Colo.
Danbury Hospital	Danbury, Conn.
Sacred Heart Hospital	Pensacola, Fla.
St. Mary's Hospital	Athens, Ga.
Georgia Baptist Hospital	Atlanta, Ga.
Macon General Hospital	Macon, Ga.
Lawrence General Hospital	Lawrence, Mass.
Lowell General Hospital	Lowell, Mass.
Staten Island Hospital	Staten Island, N. Y.
City Memorial Hospital	Winston-Salem, N. C.
St. Agnes Hospital	Philadelphia, Pa.
Johnston-Willis Hospital	Richmond, Va.
Winchester Memorial Hospital	Winchester, Va.
Seattle General Hospital	Seattle, Wash.

ADDITIONAL RESIDENCIES APPROVED

Allergy

New York Hospital	New York City

Anesthesiology

Peter Bent Brigham Hospital	Boston, Mass.
Prospect Heights Hospital	Brooklyn, N. Y.
Memorial Hospital	New York City
Ohio Valley General Hospital	Wheeling, W. Va.

Cardiovascular Diseases

Brooke Army Medical Center	San Antonio, Texas
St. Luke's Hospital	New York City

Dermatology and Syphilology

University Hospital	Oklahoma City, Okla.

Gastroenterology

Jefferson Medical College Hospital	Philadelphia, Pa.

General Practice

Charlotte Hungerford Hospital	Torrington, Conn.
Ravenswood Hospital	Chicago, Ill.
Methodist Hospital of Central Illinois	Peoria, Ill.
St. Francis Hospital	Wichita, Kan.
Wyandotte General Hospital	Wyandotte, Mich.
Alexian Brothers Hospital	St. Louis, Mo.
St. Joseph's Hospital	Fort Worth, Texas
Wichita General Hospital	Wichita Falls, Texas
Evangelical Deaconess Hospital	Milwaukee, Wis.
Milwaukee Hospital	Milwaukee, Wis.

Internal Medicine

Veterans Admin. Hospital	Fort Howard, Md.
Veterans Admin. Hospital	Houston, Texas
Veterans Admin. Hospital	Martinsburg, W. Va.
St. Anthony Hospital	Denver, Colo.
St. Francis Hospital	Hartford, Conn.
St. Mary's Hospital	Waterbury, Conn.
Women and Children's Hospital	Chicago, Ill.
St. Vincent's Hospital	Indianapolis
St. Elizabeth's Hospital	Lafayette, Ind.
St. Lawrence Hospital	Lansing, Mich.
St. Michael's Hospital	Newark, N. J.
Hospital for Special Surgery	New York City
United Hospital	Port Chester, N. Y.
St. Rita's Hospital	Lima, Ohio
Allentown Hospital	Allentown, Pa.
Baptist Memorial Hospital	Memphis, Tenn.

Neurological Surgery

Passavant Memorial Hospital	Chicago, Ill.
Bellevue Hospital, II Div. Cornell University	New York City
Bellevue Hospital, III Div., New York University	New York City

Neurology

Indiana University Medical Center	Indianapolis, Ind.
University of Oregon Medical School Hospital and Clinics	Portland, Ore.

Obstetrics and Gynecology

St. Francis Hospital *	San Francisco, Calif.
St. Vincent's Hospital	Jacksonville, Fla.
Piedmont Hospital	Atlanta, Ga.
Methodist Hospital of Central Illinois *	Peoria, Ill.
St. John's Hospital *	St. Louis, Mo.
Maimonides Hospital	Brooklyn, N. Y.
Methodist Hospital *	Memphis, Tenn.
Milwaukee Hospital	Milwaukee, Wis.
Mount Sinai Hospital	Milwaukee, Wis.

Ophthalmology

Veterans Admin. Hospital	Fort Howard, Md.
Veterans Admin. Hospital	Houston, Texas
Franklin Hospital	San Francisco, Calif.
University of Kansas Medical Center	Kansas City, Kan.
Massachusetts Memorial Hospital	Boston, Mass.

Otolaryngology

Vanderbilt University Hospital	Nashville, Tenn.

Pathology

Beth Israel Hospital	New York City
Brackenridge Hospital	Austin, Texas

Pediatrics

Waterbury Hospital	Waterbury, Conn.
Georgetown University Hospital	Washington, D. C.
St. Mary's Hospital	Grand Rapids, Mich.
St. Catherine's Hospital	Brooklyn, N. Y.
Mercy Hospital	Toledo, Ohio
Allegheny General Hospital	Pittsburgh, Pa.
San Juan City Hospital	San Juan, Puerto Rico

Physical Medicine and Rehabilitation

Veterans Admin. Hospital	Wadsworth, Kan.

Plastic Surgery

Johns Hopkins Hospital	Baltimore, Md.

Psychiatry

Veterans Admin. Hospital	Tuskegee, Ala.
Veterans Admin. Hospital	Newington, Conn.
Veterans Admin. Hospital	Dearborn, Mich.
Veterans Admin. Hospital	Houston, Texas
Indiana University Hospital	Indianapolis
University of Kansas Medical Center	Kansas City, Kan.
Massachusetts Memorial Hospital	Boston, Mass.
Minneapolis General Hospital	Minneapolis, Minn.
Longview State Hospital	Cincinnati, Ohio
Mount Sinai Hospital	Philadelphia
Philadelphia State Hospital	Philadelphia
Eastern State Hospital	Williamsburg, Va.
Territorial Hospital	Honolulu, Hawaii

Pulmonary Diseases

Veterans Admin. Hospital	Albuquerque, N. Mex.
Veterans Admin. Hospital	Houston, Texas
Veterans Admin. Hospital	Richmond, Va.
City of Chicago Municipal Tuberculosis Sanit.	Chicago, Ill.

Surgery

Coney Island Hospital	Brooklyn, N. Y.

Thoracic Surgery

U. S. Naval Hospital	St. Albans, N. Y.
Veterans Admin. Hospital	Martinsburg, W. Va.
Grace New Haven Community Hospital New Haven Unit	New Haven, Conn.
Seton Memorial Hospital	New York City
Leahi Hospital	Honolulu, Hawaii

* Approved for training in obstetrics only.

RADIOLOGY

The following services are approved by the Council and the American Board of Radiology. As indicated in the column "Type of Training" approval has been extended in diagnostic roentgenology (D. R.); roentgenology (Roent.), including diagnostic and therapeutic; therapeutic radiology (Ther. Rad.), and radiology (Rad.), including roentgenology and therapeutic radiology.

A number of services which appeared as approved in the 1950 Internship and Residency Number [1] are not included in the present list. Training in these hospitals will be acceptable until July 1, 1951, as previously announced. Several of these hospitals have requested approval after July 1, 1951, on the basis of a reorganized program. Action on these applications has not been completed. A list of additional residencies approved in radiology will be published prior to Jan. 1, 1951.

1. J. A. M. A. **142**: 1200-1204.

Name of Hospital	Location	Chief of Service	Type of Training	Length of Approved Program, Years
United States Army				
Letterman General Hospital	San Francisco, Calif.	E. A. Lodmell	Roent.	3
Fitzsimons General Hospital	Denver, Colo.	F. Y. Leaver	Roent.	3
Army Medical Center [1]	Washington, D. C.	H. I. Amory	Rad.	3
Brooke Army Medical Center [2]	San Antonio, Texas	C. A. Craig	D. R.	3
Tripler General Hospital	Moanalua, T. H.	A. O. Haff	Roent.	3
United States Navy				
U. S. Naval Hospital	Oakland, Calif.	K. H. Vinnedge	Roent.	1
U. S. Naval Hospital	San Diego, Calif.	R. C. Douthat	Rad.	3
U. S. Naval Hospital	Great Lakes, Ill.	J. P. Wood	D. R.	1
U. S. Naval Hospital	Bethesda, Md.	M. W. Mason	Roent.	2
U. S. Naval Hospital	Chelsea, Mass.	G. F. Fraser	Roent.	2
U. S. Naval Hospital	St. Albans, N. Y.	S. F. Williams	Roent.	3
U. S. Naval Hospital	Philadelphia, Pa.	A. H. Staderman	Roent.	2
United States Public Health Service				
U. S. Marine Hospital	New Orleans, La.	A. Mayoral	D. R.	2
U. S. Marine Hospital	Baltimore, Md.	J. E. Wirth	Ther. Rad.	1
U. S. Marine Hospital	Stapleton, S. I., N. Y.	W. M. Sennott	Roent.	1
Federal Security Agency				
Freedmen's Hospital	Washington, D. C.	O. H. Kelley	Rad.	3
Veterans Administration				
Veterans Admin. Hospital	Tuskegee, Ala.	J. J. Peters	D. R.	3
Veterans Admin. Hospital	Long Beach, Calif.	E. P. Bugbee and I. F. Isaacs	D. R.	1
Veterans Admin. Hospital	Los Angeles, Calif.	C. W. McClanahan	Rad.	3
Veterans Admin. Hospital	San Francisco, Calif.	W. W. Saunders	D. R.	1
Veterans Admin. Hospital	Fort Logan, Colo.	C. F. Ingersoll	D. R.	1
Veterans Admin. Hospital	Newington, Conn.	A. G. Ansprenger	D. R.	2
Veterans Admin. Hospital	Washington, D. C.	S. R. Bersack	Roent.	2
Veterans Admin. Hospital	Chamblee, Ga.	C. A. Priviteri	Roent.	2
Veterans Admin. Hospital	Hines, Ill.	F. L. Hussey	Rad.	3
Veterans Admin. Hospital	Des Moines, Iowa	W. A. Henkin	Roent.	2
Veterans Admin. Hospital	Wadsworth, Kan.	J. W. Walker	D. R.	1
Veterans Admin. Hospital	New Orleans, La.	L. Raider	D. R.	2
Veterans Admin. Hospital	Fort Howard, Md.	J. T. Brackin, Jr.	D. R.	1
Veterans Admin. Hospital	Boston (West Roxbury)	E. G. Wissing	Roent.	3
Veterans Admin. Hospital	Framingham, Mass.	D. Kornblum	D. R.	1
Veterans Admin. Hospital	Dearborn, Mich.	E. E. Levine	Roent.	2
Veterans Admin. Hospital	Minneapolis, Minn.	B. J. O'Loughlin	Roent.	3
Veterans Admin. Hospital	Jefferson Barracks, Mo.	S. Kamberg	D. R.	1
Veterans Admin. Hospital	New York City	A. Sheinmel	Rad.	3
Veterans Admin. Hospital	Staten Island, N. Y.	E. K. Brunner	D. R.	2
Veterans Admin. Hospital	Cleveland, Ohio	M. D. Sachs	Rad.	3
Veterans Admin. Hospital	Dayton, Ohio	F. A. Bavendam	D. R.	1
Veterans Admin. Hospital	Oklahoma City, Okla.	S. M. Glasser	D. R.	1
Veterans Admin. Hospital	Portland, Ore.	K. Hardesty	Roent.	3
Veterans Admin. Hospital	Aspinwall, Pa.	G. H. Alexander	Roent.	3
Veterans Admin. Hospital	Columbia, S. C.	H. Potosky	D. R.	1
Veterans Admin. Hospital	Memphis, Tenn.	W. H. Mendel	Rad.	2
Veterans Admin. Hospital	Nashville, Tenn.	K. R. Delbert	D. R.	1
Veterans Admin. Hospital	Dallas, Texas	J. J. Sazama, Jr.	Rad.	3
Veterans Admin. Hospital	McKinney, Texas	B. K. Lovell	Rad.	2
Veterans Admin. Hospital	White River Junction, Vt.	N. W. Loud	Roent.	1
Veterans Admin. Hospital	Richmond, Va.	S. Richmond	Roent.	2
Veterans Admin. Hospital	Milwaukee, Wis.	T. J. Pfeffer	Roent.	1
Nonfederal				
Jefferson-Hillman Hospital	Birmingham, Ala.	M. Barfield-Carter	Rad.	3
St. Monica's Hospital and Health Center	Phoenix, Ariz.	J. Foster	D. R.	1
Tucson Medical Center	Tucson, Ariz.	A. J. Present	D. R.	1
University Hospital	Little Rock, Ark.	I. Meschan	Rad.	3
San Joaquin General Hospital	French Camp, Calif.	A. M. Cove	Rad.	2
General Hospital of Fresno County	Fresno, Calif.	C. L. Ould	D. R.	1
Seaside Memorial Hospital	Long Beach, Calif.	H. J. Prichard	Rad.	3
Cedars of Lebanon Hospital	Los Angeles, Calif.	E. Freedman and H. L. Jaffe	Rad.	3
Hospital of the Good Samaritan	Los Angeles, Calif.	R. T. Taylor	Rad.	2
Los Angeles County Hospital	Los Angeles, Calif.	R. A. Carter	Rad.	3
Queen of Angels Hospital	Los Angeles, Calif.	J. W. Crossan	Rad.	2
St. Vincent's Hospital	Los Angeles, Calif.	K. S. Davis	Rad.	2
White Memorial Hospital	Los Angeles, Calif.	W. L. Stilson	Rad.	3

RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Type of Training	Length of Approved Program, Years
Highland-Alameda County Hospital	Oakland, Calif.	H. H. Jensen	Rad.	3
Collis P. and Howard Huntington Memorial Hospital	Pasadena, Calif.	J. F. Chapman and R. S. Harrison	D. R.	2
Sutter General Hospital	Sacramento, Calif.	R. S. Graham	Rad.	2
Children's Hospital	San Francisco, Calif.	G. G. King	Roent.	1
Franklin Hospital	San Francisco, Calif.	A. J. Williams	Roent.	1
St. Francis Hospital	San Francisco, Calif.	A. A. deLorimier	Roent.	1
St. Mary's Hospital	San Francisco, Calif.	C. S. Capp	Roent.	1
San Francisco Hospital	San Francisco, Calif.	L. H. Garland and J. A. Williams	Roent.	3
Stanford University Hospital	San Francisco, Calif.	H. S. Kaplan	Rad.	3
University of California Hospital	San Francisco, Calif.	R. S. Stone	Rad.	3
Santa Barbara Cottage Hospital	Santa Barbara, Calif.	M. J. Geyman and R. Gates	Rad.	3
Glockner-Penrose Hospital	Colorado Springs, Colo.	J. A. del Regato and J. W. McMullen	Ther. Rad.	1
St. Francis Hospital and Sanatorium	Colorado Springs, Colo.	H. V. Bolton	D. R.	2
Presbyterian Hospital	Denver, Colo.	K. D. A. Allen	Roent.	3
St. Luke's Hospital	Denver, Colo.	W. P. Stampfli	Roent.	2
University of Colorado Medical Center				
Colorado General Hospital	Denver, Colo.	M. H. Levine	Roent.	3
Denver General Hospital	Denver, Colo.	.....	D. R.	1
Corwin Hospital	Pueblo, Colo.	G. A. Unfug	D. R.	2
Bridgeport Hospital	Bridgeport, Conn.	B. M. Parmelee	Rad.	2
Hartford Hospital	Hartford, Conn.	D. J. Roberts	Rad.	3
Grace-New Haven Community Hospital				
Grace Unit	New Haven, Conn.	R. M. Lowman	Roent.	2
New Haven Unit (University Service)	New Haven, Conn.	A. H. Janzen	Roent.	3
Hospital of St. Raphael	New Haven, Conn.	R. Shapiro	Roent.	2
Waterbury Hospital	Waterbury, Conn.	S. Blank	Roent.	1
Delaware Hospital	Wilmington, Del.	W. W. Lattomus	D. R.	2
Central Dispensary and Emergency Hospital	Washington, D. C.	J. E. Wissler	Rad.	3
Doctors Hospital	Washington, D. C.	A. C. Christie	Rad.	3
Garfield Memorial Hospital	Washington, D. C.	A. C. Hampton	Rad.	3
Georgetown University Hospital	Washington, D. C.	W. E. Baensch	Rad.	3
George Washington University Hospital	Washington, D. C.	W. W. Stanbro	Roent.	3
Crawford W. Long Hospital	Atlanta, Ga.	W. F. Lake	Roent.	1
Grady Memorial Hospital	Atlanta, Ga.	H. S. Weens	Rad.	3
Piedmont Hospital	Atlanta, Ga.	G. Hrdlicka	D. R.	1
University Hospital	Augusta, Ga.	L. P. Holmes	Roent.	3
Emory University Hospital	Emory University, Ga.	T. F. Leigh	Rad.	3
Augustana Hospital	Chicago, Ill.	D. S. Bellin	Roent.	3
Cook County Hospital	Chicago, Ill.	G. M. Landau	Rad.	3
Illinois Masonic Hospital	Chicago, Ill.	J. H. Gilmore	Roent.	1
Mercy Hospital-Loyola University Clinics	Chicago, Ill.	W. Furey	Rad.	2
Michael Reese Hospital	Chicago, Ill.	R. A. Arens	Rad.	3
Mount Sinai Hospital	Chicago, Ill.	J. Arendt	Roent.	2
Northwestern University Medical Center				
Passavant Memorial Hospital	Chicago, Ill.	R. B. Lewis	Roent.	3
Wesley Memorial Hospital	Chicago, Ill.	E. E. Barth	Rad.	3
Presbyterian Hospital	Chicago, Ill.	F. H. Squire	Rad.	3
Provident Hospital	Chicago, Ill.	W. P. Quinn	Rad.	3
Ravenswood Hospital	Chicago, Ill.	D. L. Jenkinson	Roent.	3
Research and Educational Hospitals	Chicago, Ill.	R. A. Harvey	Rad.	3
St. Bernard's Hospital	Chicago, Ill.	B. C. Cushway	Rad.	2
St. Luke's Hospital	Chicago, Ill.	E. L. Jenkinson	Roent.	3
University of Chicago Clinics	Chicago, Ill.	P. C. Hodges	Rad.	3
Evanston Hospital	Evanston, Ill.	R. G. Willy	Rad.	3
St. Francis Hospital	Evanston, Ill.	A. C. Ledoux	Roent.	2
Little Company of Mary Hospital	Evergreen Park, Ill.	W. W. Furey	D. R.	1
St. Francis Hospital	Peoria, Ill.	P. R. Dirkse	Roent.	2
Clinic Hospital	Bluffton, Ind.	W. S. Tirman	Roent.	2
St. Joseph Hospital	Fort Wayne, Ind.	C. H. Warfield	Roent.	2
St. Margaret's Hospital	Hammond, Ind.	J. F. Larrabee	D. R.	1
Indiana University Medical Center	Indianapolis, Ind.	J. A. Campbell	Rad.	3
Methodist Hospital	Indianapolis, Ind.	H. C. Ochsner	Rad.	3
St. Elizabeth Hospital	LaFayette, Ind.	D. C. McClelland	Roent.	2
Ball Memorial Hospital	Muncie, Ind.	B. W. Stocking	Roent.	2
Iowa Methodist Hospital	Des Moines, Iowa	T. A. Burcham	Rad.	3
University Hospitals	Iowa City, Iowa	H. D. Kerr	Rad.	3
University of Kansas Medical Center	Kansas City, Kansas	G. M. Tice	Rad.	3
Wesley Hospital	Wichita, Kansas	N. C. Nash	Rad.	1
Norton Memorial Infirmary	Louisville, Ky.	J. C. Bell	Rad.	1
St. Joseph Infirmary	Louisville, Ky.	S. E. Johnson	Rad.	3
University of Louisville Hospitals [3]	Louisville, Ky.	E. L. Pirkey and D. Shapiro	Rad.	3
Baptist Hospital	Alexandria, La.	H. O. Barker	Rad.	3
Charity Hospital of Louisiana	New Orleans, La.	L. Menville	Rad.	3
Ochsner Foundation Hospital	New Orleans, La.	E. H. Little	Rad.	3
Southern Baptist Hospital	New Orleans, La.	L. Bristow	Rad.	3
Touro Infirmary	New Orleans, La.	E. A. Schmidt	Rad.	3
Shreveport Charity Hospital	Shreveport, La.	G. M. Riley and W. H. Carroll	Rad.	2
Eastern Maine General Hospital	Bangor, Me.	H. A. Smith	Roent.	2
Baltimore City Hospitals	Baltimore, Md.	S. H. Macht	D. R.	1
Johns Hopkins Hospital [4]	Baltimore, Md.	R. H. Morgan	Rad.	3
Sinai Hospital	Baltimore, Md.	J. O. Salik	Roent.	1
Union Memorial Hospital	Baltimore, Md.	W. B. Firor	D. R.	1
University Hospital	Baltimore, Md.	W. L. Kilby	Rad.	3
Beth Israel Hospital	Boston, Mass.	S. A. Robins	Roent.	2
Boston City Hospital	Boston, Mass.	M. Ritvo	Rad.	3
Children's Hospital	Boston, Mass.	E. B. D. Neuhauser	Roent.	2
Faulkner Hospital	Boston, Mass.	L. E. Hawes	Roent.	2
Lahey Clinic	Boston, Mass.	H. F. Hare	Rad.	3

RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Type of Training	Length of Approved Program, Years
Massachusetts General Hospital	Boston, Mass.	L. L. Robbins	Rad.	3
Massachusetts Memorial Hospital	Boston, Mass.	G. Levene	Roent.	3
New England Center Hospital	Boston, Mass.	A. Ettinger	Roent.	2
New England Deaconess Hospital	Boston, Mass.	J. H. Marks	Roent.	3
Peter Bent Brigham Hospital	Boston, Mass.	M. C. Sosman	Rad.	3
St. Elizabeth's Hospital	Boston, Mass.	W. A. Carey	D. R.	1
Mount Auburn Hospital	Cambridge, Mass.	R. Schatzki	Roent.	1
Newton-Wellesley Hospital	Newton, Mass.	C. Liebman	Roent.	1
Salem Hospital	Salem, Mass.	S. A. Wilson	Roent.	3
Pondville Hospital	Walpole, Mass.	M. C. Sosman	Ther. Rad.	1
Memorial Hospital	Worcester, Mass.	W. J. Elliot	Roent.	1
St. Joseph Mercy Hospital	Ann Arbor, Mich.	S. W. Donaldson	Rad.	3
University Hospital	Ann Arbor, Mich.	F. J. Hodges	Rad.	3
Leila Y. Post Montgomery Hospital	Battle Creek, Mich.	S. P. Barden	Rad.	3
Children's Hospital	Detroit, Mich.	W. A. Evans	D. R.	1
City of Detroit Receiving Hospital	Detroit, Mich.	I. D. Harris	D. R.	2
Grace Hospital	Detroit, Mich.	H. A. Jarre	Rad.	3
Harper Hospital	Detroit, Mich.	L. Reynolds	Rad.	3
Henry Ford Hospital	Detroit, Mich.	H. P. Doub	Rad.	3
Herman Kiefer Hospital	Detroit, Mich.	C. C. Birkelo	D. R.	1
Mount Carmel Mercy Hospital	Detroit, Mich.	J. M. Grace	Roent.	2
Providence Hospital	Detroit, Mich.	W. A. Irwin	Rad.	3
Wayne County General Hospital and Infirmary	Eloise, Mich.	N. B. Shippey	Rad.	1
Hurley Hospital	Flint, Mich.	D. R. Limbach	Rad.	3
Butterworth Hospital	Grand Rapids, Mich.	R. J. McCandliss	Rad.	1
Hackley Hospital	Muskegon, Mich.	L. E. Holly	Rad.	3
Northwestern Hospital	Minneapolis, Minn.	O. O. Hansen	Rad.	3
Swedish Hospital	Minneapolis, Minn.	G. T. Nordin	Rad.	3
University of Minnesota Hospitals	Minneapolis, Minn.	L. G. Rigler	Rad.	3
Mayo Foundation	Rochester, Minn.	B. R. Kirklin	Rad.	3
Charles T. Miller Hospital	St. Paul, Minn.	H. O. Peterson and E. Schons	Rad.	3
St. Joseph's Hospital	St. Paul, Minn.	J. P. Medelman	Roent.	1
Kansas City General Hospital No. 1	Kansas City, Mo.	L. Scarpellino and D. S. Dann	Roent.	2
Kansas City General Hospital No. 2	Kansas City, Mo.	I. Lockwood	D. R.	3
Menorah Hospital	Kansas City, Mo.	D. S. Dann	Rad.	1
Research Hospital	Kansas City, Mo.	I. Lockwood	Rad.	3
St. Joseph Hospital	Kansas City, Mo.	C. E. Virden	Rad.	3
St. Luke's Hospital	Kansas City, Mo.	L. A. Scarpellino	Roent.	2
Barnard Free Skin and Cancer Hospital	St. Louis, Mo.	E. C. Ernst	Ther. Rad.	1
Barnes Hospital	St. Louis, Mo.	H. Wilson	Rad.	3
De Paul Hospital	St. Louis, Mo.	E. C. Ernst	Rad.	2
Homer G. Phillips Hospital	St. Louis, Mo.	W. E. Allen, Jr.	Rad.	3
Jewish Hospital	St. Louis, Mo.	P. C. Schnoebelen	Rad.	2
St. Louis City Hospital	St. Louis, Mo.	L. Sante and D. C. Weir	Rad.	3
St. Luke's Hospital	St. Louis, Mo.	O. C. Zink	Roent.	3
St. Mary's Group of Hospitals	St. Louis, Mo.	L. R. Sante	Rad.	3
Creighton Memorial St. Joseph's Hospital	Omaha, Nebr.	J. F. Kelly	Rad.	3
Nebraska Methodist Hospital	Omaha, Nebr.	H. B. Hunt	Rad.	3
University of Nebraska Hospital	Omaha, Nebr.	H. B. Hunt	Rad.	3
Mary Hitchcock Memorial Hospital	Hanover, N. H.	L. K. Sycamore	Rad.	3
Atlantic City Hosptial	Atlantic City, N. J.	R. A. Bradley	Roent.	2
Cooper Hospital	Camden, N. J.	P. D. Gilbert	Roent.	1
Jersey City Hospital	Jersey City, N. J.	H. J. Periberg	Rad.	2
Hospital of St. Barnabas and for Women and Children	Newark, N. J.	P. J. Gianquinto	Roent.	2
Newark Beth Israel Hospital	Newark, N. J.	N. J. Furst	Rad.	3
Orange Memorial Hospital	Orange, N. J.	W. H. Seward	Roent.	1
Mercer Hospital	Trenton, N. J.	M. P. Mains	Roent.	3
Albany Hospital	Albany, N. Y.	W. P. Howard	Roent.	2
Brooklyn Cancer Institute	Brooklyn, N. Y.	W. E. Howes	Ther. Rad.	3
Brooklyn Hospital	Brooklyn, N. Y.	J. H. Wentworth	Rad.	3
Jewish Hospital	Brooklyn, N. Y.	M. G. Wasch	Rad.	3
Kings County Hospital	Brooklyn, N. Y.	B. Ehrenpreis	Rad.	3
Long Island College Hospital	Brooklyn, N. Y.	A. L. L. Bell	Rad.	3
Maimonides Hospital	Brooklyn, N. Y.	L. Nathanson	D. R.	2
Methodist Hospital	Brooklyn, N. Y.	G. W. Cramp	Roent.	2
Buffalo General Hospital	Buffalo, N. Y.	G. O. Culver	Roent.	3
Deaconess Hospital	Buffalo, N. Y.	R. E. Seibel	Roent.	2
Edward J. Meyer Memorial Hospital	Buffalo, N. Y.	E. G. Eschner	Roent.	3
Roswell Park Memorial Institute	Buffalo, N. Y.	W. T. Murphy	Ther. Rad.	3
Clifton Springs Sanatorium and Clinic	Clifton Spring, N. Y.	G. S. Schwarz	D. R.	1
Meadowbrook Hospital	Hempstead, N. Y.	J. J. LaVine	Roent.	1
Queens General Hospital	Jamaica, N. Y.	I. S. Startz	Roent.	3
Charles S. Wilson Memorial Hospital	Johnson City, N. Y.	B. D. Jay	D. R.	1
Mount Vernon Hospital	Mount Vernon, N. Y.	L. M. Bond	Roent.	2
New Rochelle Hospital	New Rochelle, N. Y.	J. F. Miller	Rad.	2
Bellevue Hospital				
Division III—New York University	New York City	I. I. Kaplan	Ther. Rad.	2
Division IV—Open Division	New York City	L. J. Friedman	D. R.	1
Beth Israel Hospital	New York City	A. J. Bendick	Roent.	3
Bronx Hospital	New York City	W. Snow	Roent.	2
Doctors Hospital	New York City	A. J. Tillinghast	D. R.	1
Flower and Fifth Avenue Hospitals	New York City	F. Borrelli	Rad.	3
French Hospital	New York City	E. M. Claiborne	Roent.	2
Goldwater Memorial Hospital	New York City	H. K. Taylor	D. R.	1
Hospital for Joint Diseases	New York City	M. M. Pomeranz	Rad.	3
Lenox Hill Hospital	New York City	F. H. Ghiselin	D. R.	3
Lincoln Hospital	New York City	E. Kraft	Roent.	2
Memorial Hospital	New York City	R. S. Sherman	Rad.	2
Montefiore Hospital for Chronic Diseases	New York City	S. Fineman	D. R.	1
		J. R. Freid	Ther. Rad.	1

RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Type of Training	Length of Approved Program, Years
Morrisania City Hospital	New York City	S. F. Weltzner and P. Cohen	Rad.	2
Mount Sinai Hospital	New York City	B. S. Wolf and W. Harris	Rad.	2
New York City Hospital	New York City	A. L. Bachman	D. R.	2
New York Hospital	New York City	R. P. Ball	Rad.	3
New York Polyclinic Medical School and Hospital	New York City	W. H. Shehadi	Roent.	2
Presbyterian Hospital	New York City	R. Golden	Rad.	3
Roosevelt Hospital	New York City	C. A. Smith	Rad.	3
St. Luke's Hospital	New York City	H. F. Hempel	Rad.	3
St. Vincent's Hospital	New York City	W. W. Mayer	Rad.	1
Sydenham Hospital	New York City	J. E. Moseley	Roent.	1
University Hospital	New York City	C. C. Gottlieb	Rad.	3
United Hospital	Port Chester, N. Y.	T. S. West	Roent.	1
Rochester General Hospital	Rochester, N. Y.	E. F. Merrill	Roent.	3
St. Mary's Hospital	Rochester, N. Y.	A. V. Winchell and H. Forsyth	Roent.	2
Strong Memorial-Rochester Municipal Hospitals	Rochester, N. Y.	G. H. Ramsey	Rad.	3
Ellis Hospital	Schenectady, N. Y.	K. L. Mitton	Roent.	1
Sea View Hospital	Staten Island, N. Y.	A. V. Shapiro	D. R.	1
Crouse-Irving Hospital	Syracuse, N. Y.	C. F. Potter	Roent.	2
Syracuse Medical Center	Syracuse, N. Y.	C. H. Hale	Rad.	3
Grasslands Hospital	Valhalla, N. Y.	A. G. Debbie	Roent.	3
Charlotte Memorial Hospital	Charlotte, N. C.	W. C. A. Sternbergh	Roent.	1
Duke Hospital	Durham, N. C.	R. J. Reeves	Rad.	3
Watts Hospital	Durham, N. C.	W. W. Vaughan	Rad.	3
Bismarck Evangelical Hospital	Bismarck, N. Dak.	H. M. Berg	Rad.	3
City Hospital	Akron, Ohio	F. T. Moore	Rad.	3
Peoples Hospital	Akron, Ohio	E. L. Yoke	Rad.	3
Aultman Hospital	Canton, Ohio	S. Larson	Rad.	1
Mercy Hospital	Canton, Ohio	J. J. Douglas	D. R.	3
Cincinnati General Hospital	Cincinnati, Ohio	B. Felson	Rad.	3
Good Samaritan Hospital	Cincinnati, Ohio	J. E. McCarthy	Rad.	2
Jewish Hospital	Cincinnati, Ohio	S. Brown	Rad.	3
City Hospital	Cleveland, Ohio	H. Hauser	Rad.	3
Cleveland Clinic Hospital	Cleveland, Ohio	C. R. Hughes and U. V. Portmann	Rad.	3
Lutheran Hospital	Cleveland, Ohio	J. A. Groh	Roent.	2
Mount Sinai Hospital	Cleveland, Ohio	H. A. Mahrer	Roent.	3
St. Luke's Hospital	Cleveland, Ohio	D. D. Brannan	Rad.	3
St. Vincent's Charity Hospital	Cleveland, Ohio	E. J. O'Malley	Rad.	3
University Hospitals	Cleveland, Ohio	H. L. Friedell	Rad.	3
Ohio State University Hospital	Columbus, Ohio	H. J. Means	Rad.	3
Miami Valley Hospital	Dayton, Ohio	G. A. Nicoll	Rad.	3
St. Elizabeth's Hospital	Dayton, Ohio	H. Snow	Rad.	3
St. Vincent's Hospital	Toledo, Ohio	C. E. Hufford	D. R.	1
Youngstown Hospital	Youngstown, Ohio	E. C. Baker	Rad.	3
University Hospitals	Oklahoma City, Okla.	P. E. Russo	Rad.	3
St. Vincent's Hospital	Portland, Ore.	S. E. Rees	Roent.	3
University of Oregon Medical School Hospitals and Clinics	Portland, Ore.	W. Y. Burton	Rad.	3
Abington Memorial Hospital	Abington, Pa.	J. D. Zulick	Roent.	3
Bryn Mawr Hospital	Bryn Mawr, Pa.	R. S. Bromer	Rad.	3
George F. Geisinger Memorial Hospital	Danville, Pa.	C. L. Hinkel	Rad.	3
St. Vincent's Hospital	Erie, Pa.	R. D. Bacon	Rad.	3
American Oncologic Hospital	Philadelphia	S. G. Castigliano	Ther. Rad.	3
Episcopal Hospital	Philadelphia	D. A. Sampson	Rad.	3
Frankford Hospital	Philadelphia	M. T. Woodruff	D. R.	1
Germantown Dispensary and Hospital	Philadelphia	B. R. Young	Rad.	3
Graduate Hospital of the University of Pa.	Philadelphia	A. Finklestein	Rad.	3
Hahnemann Hospital	Philadelphia	J. S. Lehman	Rad.	3
Hospital of the University of Pennsylvania	Philadelphia	E. P. Pendergrass	Rad.	3
Hospital of the Woman's Medical College of Pennsylvania	Philadelphia	J. H. Vastine	Roent.	3
Jeanes Hospital	Philadelphia	J. Freed	Ther. Rad.	2
Jefferson Medical College Hospital	Philadelphia	P. C. Swenson	Rad.	3
Jewish Hospital	Philadelphia	J. Gershon-Cohen	Rad.	3
Mount Sinai Hospital	Philadelphia	L. Edelben	Rad.	2
Nazareth Hospital	Philadelphia	J. S. Fetter	Roent.	2
Pennsylvania Hospital	Philadelphia	P. A. Bishop	Rad.	3
Philadelphia General Hospital	Philadelphia	R. P. Widmann	Rad.	3
Presbyterian Hospital	Philadelphia	F. L. Lame	Rad.	3
Temple University Hospital	Philadelphia	W. E. Chamberlain	Rad.	3
Mercy Hospital	Pittsburgh, Pa.	J. A. L. McCullough	Rad.	3
Montefiore Hospital	Pittsburgh, Pa.	M. F. Goldsmith	Roent.	3
St. Francis Hospital	Pittsburgh, Pa.	L. H. Osmond	Roent.	3
University of Pittsburgh Medical Center [5]	Pittsburgh, Pa.	G. W. Grier	Rad.	3
Western Pennsylvania Hospital	Pittsburgh, Pa.	R. G. Alley and E. J. Euphrat	Rad.	2
Reading Hospital	Reading, Pa.	G. W. Chamberlin	Rad.	3
Robert Packer Hospital	Sayre, Pa.	S. P. Perry	Rad.	3
Chester County Hospital	West Chester, Pa.	J. Gershon-Cohen	Roent.	1
Rhode Island Hospital	Providence, R. I.	L. A. Martineau	Roent.	3
Roper Hospital	Charleston, S. C.	H. S. Petit	Roent.	1
Columbia Hospital	Columbia, S. C.	G. W. Smith, Jr.	Roent.	1
Spartanburg General Hospital	Spartanburg, S. C.	H. E. Pierce	Rad.	2
Baptist Memorial Hospital	Memphis, Tenn.	J. E. Whitecleather	Roent.	3
John Gaston Hospital	Memphis, Tenn.	D. Carroll	Rad.	3
Methodist Hospital	Memphis, Tenn.	J. C. King	Roent.	3
Vanderbilt University Hospital	Nashville, Tenn.	C. C. McClure	Rad.	3
Baylor University Hospital	Dallas, Texas	J. E. Miller	Rad.	3
Parkland Hospital	Dallas, Texas	R. S. Clayton	Rad.	3
St. Paul's Hospital	Dallas, Texas	G. D. Carlson	Roent.	1
University of Texas Medical Branch Hospitals John Sealy Hospital	Galveston, Texas	J. C. Rude	Rad.	3
Hermann Hospital	Houston, Texas	L. M. Vaughan	Rad.	1
M. D. Anderson Hospital for Research Cancer	Houston, Texas	G. Fletcher	Ther. Rad.	1
Methodist Hospital	Houston, Texas	C. H. Berge	Roent.	1
St. Joseph's Infirmary	Houston, Texas	P. E. Wigby	Rad.	3
Santa Rosa Hospital	San Antonio, Texas	M. Davis	D. R.	1
Scott and White Hospital	Temple, Texas	C. A. Stevenson	Rad.	3
Wichita Falls Clinic Hospital	Wichita Falls, Texas	C. D. Wilson	Rad.	1
University of Utah Affiliated Hospitals	Salt Lake City, Utah		Rad.	3
Bishop DeGoesbriand Hospital	Burlington, Vt.	F. Van Buskirk	Roent.	1
Mary Fletcher Hospital	Burlington, Vt.	A. B. Soule, Jr., and O. S. Peterson, Jr.	Rad.	3

RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Type of Training	Length of Approved Program, Years
University of Virginia Hospital	Charlottesville, Va.	V. W. Archer	Roent.	3
De Paul Hospital	Norfolk, Va.	W. H. Whitmore	Roent.	1
Norfolk General Hospital	Norfolk, Va.	P. B. Parsons and L. B. Waters	Rad.	3
Medical College of Virginia Hospital Divison	Richmond, Va.	F. B. Mandeville	Rad.	3
Swedish Hospital (Tumor Clinic)	Seattle, Wash.	S. Cantril	Ther. Rad.	3
Virginia Mason Hospital	Seattle, Wash.	T. Carille	Rad.	2
Sacred Heart Hospital	Spokane, Wash.	M. Harris and G. Bracher	Rad.	2
Methodist Hospital	Madison, W's.	W. L. Waskow	Roent.	1
St. Mary's Hospital	Madison, Wis.	C. F. Sherman	Roent.	1
State of Wisconsin General Hospital	Madison, Wis.	E. A. Pohle and L. W. Paul	Rad.	3
St. Joseph's Hospital	Marshfield, Wis.	J. M. Wickham	Rad.	3
Columbia Hospital	Milwaukee, Wis.	S. A. Morton	Rad.	3
Evangelical Deaconess Hospital	Milwaukee, Wis.	A. M. Melamed	Roent.	1
Milwaukee County Hospital	Milwaukee, Wis.	J. L. Marks	D. R.	1
Milwaukee Hospital	Milwaukee, Wis.	H. W. Hefke	Rad.	3
Queens Hospital	Honolulu, Hawaii	L. L. Buzaid	Roent.	2

The following hospitals offer acceptable training which is integrated with or contributing to the fully approved program in the listing of which the footnote reference appears.

1. Walter Reed General Hospital and Army Medical Department Research and Graduate School.
2. Brooke General Hospital, 4th Army Medical Laboratory, and Medical Field Service School.
3. Louisville General Hospital and Veterans Administration Hospital, Louisville, Ky.
4. Shriners Hospital for Crippled Children, Salt Lake City.
5. Presbyterian Hospital, Woman's Hospital, Eye and Ear Hospital, Elizabeth Steele Magee Hospital, Children's Hospital and Western Psychiatric Institute and Clinic, Pittsburgh.

GRADUATE TRAINING PROGRAMS

Acceptable by the American Board of Psychiatry and Neurology

The Council on Medical Education and Hospitals has limited its approval of programs for graduate training to those offered in connection with general or special hospitals. The following information is published, however, at the request of the American Board of Psychiatry and Neurology to indicate the availability of a special type of training which is acceptable to the board and carries full credit toward certification by that board.

REQUIREMENTS FOR ACCEPTANCE

In order to facilitate the arrangements for training in child psychiatry (which constitutes a major aspect of modern psychiatry), the American Board of Psychiatry and Neurology will accept one year of training in psychiatric clinics for children which may or may not be a part of a hospital approved for residency training, provided such a clinic gives adequate supervision and instruction for full time training during the entire third year of the required three year formal training period. For the purpose of evaluating such clinics, the following conditions and criteria are deemed essential by the American Board of Psychiatry and Neurology:

1. That the clinic have a full time medical director, psychologist, and social worker qualified by training and experience in child psychiatry and allied fields to supervise the training of residents.

2. That the major portion of such training be devoted to therapy adequately supervised by this qualified staff.

3. That the service and teaching activities of the clinic be integrated with those of the community and its social agencies.

4. That clinic work be supplemented by seminars, case conferences, journal clubs or other opportunities for the discussion of the basic principles involved in outpatient work with children and parents, teacher, public health and welfare agency personnel.

5. That such a training clinic be well established in the community with a qualified staff that has operated together long enough as a team to insure stable and sound functioning.

6. That the senior members of the clinic team show evidence of previous experience in the teaching of psychiatry in general, child psychiatry in particular, and their allied fields.

These criteria set forth by the Board pertain more particularly to community sponsored clinics offering full time training in child psychiatry during the third year of formal residency training. If these clinics are affiliated with hospitals already maintaining approved programs, separate approval is not required unless warranted on the basis of their meeting all requirements for straight fellowship training in child psychiatry.

The following clinics are acceptable to the American Board of Psychiatry and Neurology as qualifying under these provisions.

Center	Director
Pasadena Child Guidance Clinic 40 E. Dayton Central Park Pasadena 2, Calif.	Dr. M. B. Durfee
Children's Psychiatric Division Langley Porter Clinic San Francisco	Dr. Stanislaus Szurek
Institute for Juvenile Research 907 S. Wolcott Ave. Chicago	Dr. Sophie S. Sloman
Louisville Mental Hygiene Clinic and Child Study School 610 S. Floyd Street Louisville, Ky.	Dr. Spafford Ackerly
The Guidance Center 1737 Prytania Street New Orleans	Dr. Milton F. Kirkpatrick
The Psychiatric Clinic of the Mental Hygiene Society of Maryland Baltimore	Dr. H. Whitman Newell
Judge Baker Guidance Center 38 Beacon Street Boston	Dr. George E. Gardner
Children's Center 244 Townsend Street Roxbury, Mass.	Dr. Marian Putnam and Mrs. Beata Rank, Co-directors
Worcester Child Guidance Clinic 2 State Street Worcester 5, Mass.	Dr. Joseph Weinreb
Amherst H. Wilder Clinic 279 Rice Street St. Paul	Dr. Hyman S. Lippman
Jewish Board of Guardians 228 East 19th Street New York 3	Dr. Joachim Flescher
Central Clinic Cincinnati General Hospital Cincinnati	Dr. Maurice Levine
Cleveland Guidance Center 2525 Euclid Avenue Cleveland	Dr. Claire M. Ness
Child Guidance Clinic 1711 Fitzwater Street Philadelphia 46	Dr. Frederick H. Allen
Pittsburgh Child Guidance Clinic 3004 Victoria Street Pittsburgh 13	Dr. Harry M. Little
Children's Service Center of Wyoming Valley 335 South Franklin Street Wilkes-Barre, Pa.	Dr. J. Franklin Robinson

APPROVED MEDICAL SCHOOLS IN THE UNITED STATES

ALABAMA

Birmingham

Medical College of Alabama.—Established in 1943 as a division of the University of Alabama. Located in Birmingham in 1944. In 1945 assumed title to Jefferson Hospital and Hillman Hospital, Birmingham. The Medical College of Alabama cares for all indigent patients of the county and city, maintenance of which is paid to the university on a per diem basis by the county. In 1943 the appropriation included $1,000,000 for the building of a new medical school which is now under construction, and temporary quarters are now in the Jefferson-Hillman Hospital. After completion of the new building which will house the basic sciences the current enrollment of 56 in the freshman class will be increased to 80, beginning in the fall of 1951. First instruction in the Medical College of Alabama started June 4, 1945, with a junior class and this class was graduated in October 1946. On October 8, 1945, the School of the Basic Medical Sciences on the University Campus, established in 1920, and its faculty, were absorbed into the new Medical College of Alabama. The medical college is coeducational. Minimum entrance requirements are three years of college work. Tuition is as follows: for legal residents of Alabama $400 per academic year plus incidental fees of $20. Nonresidents of the state are charged an additional $225 each session. The registration for the 1949-1950 session was 210; graduates 51. The last session began for the first and second years on September 16, 1949, and for the third and fourth years on September 6, 1949. The session ended for all four classes on June 3, 1950. The next session for the first and second year classes will start September 15, 1950, and for the third and fourth year classes the session will begin September 8, 1950. All classes will end June 2, 1951. The Acting Dean is Tinsley Harrison, M.D.

ARKANSAS

Little Rock

University of Arkansas School of Medicine, 1209 McAlmont Street.—Organized in 1879 as the Medical Department of Arkansas Industrial University. Present title in 1899. In 1911 the College of Physicians and Surgeons united with it and it became an integral part of the University of Arkansas. The first class was graduated in 1880. Clinical teaching was suspended in 1918 but resumed in 1923. Coeducational since organization. The curriculum covers four sessions of nine months each. Entrance requirements are three years of collegiate work. The B.S. degree is conferred at the end of the second year. The fees for the four years for residents of Arkansas are $380 a year; nonresidents are charged $505 a year. The registration for the 1949-1950 session was 323; graduates 69. The last session began September 26, 1949, and ended June 16, 1950. The next session will begin September 25, 1950, and will end June 18, 1951. The Dean is Hayden C. Nicholson, M.D.

CALIFORNIA

Loma Linda-Los Angeles

College of Medical Evangelists, Loma Linda; Boyle and Michigan Avenues, Los Angeles 33.—Organized in 1909. The first class graduated in 1914. The laboratory departments are at Loma Linda; the clinical departments at Los Angeles. Coeducational since organization. Three years of collegiate work are required for admission. The freshman, sophomore and junior years consist of nine month academic sessions and the senior year will have in addition to the nine month session a seven weeks' clinical clerkship during the summer between the junior and senior years. A twelve month internship in an approved hospital is required. The yearly tuitions including fees are respectively, $737.00, $725.50, $741.25 and $748.75. The registration for 1949-1950 was 359; graduates 73. The last session for freshman and sophomore students began on Sept. 4, 1949 and ended June 9, 1950 respectively. The junior session began on Sept. 11, 1949 and ended June 9, 1950. The senior session began June 12, 1949 and was completed June 11, 1950. The next session for freshman and sophomore students will begin Sept. 3, 1950, junior students Sept. 10, 1950 and senior students began June 11, 1950 and will end June 8, 1951 for the first three classes and June 10, 1951 for seniors. The President is George T. Harding, M.D., Los Angeles. The deans are Harold Shryock, M.D., Loma Linda, and William F. Norwood, Ph.D., Los Angeles.

Los Angeles

University of Southern California School of Medicine, 3518 University Avenue, Zone 7.—Organized in 1895 as the University of Southern California College of Medicine. First class graduated in 1899. In 1908 it became the Los Angeles Medical Department of the University of California. In 1909 the College of Physicians and Surgeons, established in 1904, became the Medical Department of the University of Southern California. Its activities were suspended in 1920; reorganized in May 1928, under present title. Entrance requirements are three years of college work. An internship is required for graduation. Coeducational since organization. Annual fees amount to approximately $600. The registration for 1949-1950 was 267; graduates 60. The last session began Sept. 12, 1949 and ended June 9, 1950. The next session will begin Sept. 18, 1950 and will end June 16, 1951. The Dean is Burrell O. Raulston, M.D.

San Francisco

University of California School of Medicine, Medical Center, San Francisco 22.—Organized in 1864 as the Toland Medical College. The first class graduated in 1864. In 1873 it became the Medical Department of the University of California. In 1909, by legislative enactment, the College of Medicine of the University of Southern California at Los Angeles became a clinical department but was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged and elective chairs in homeopathic materia medica and therapeutics were provided. Coeducational since organization. Three years of collegiate work are required for admissoin. The work of the first year is given at Berkeley and that of the last three years at San Francisco. The medical course consists of four academic years, each containing two semesters of sixteen weeks each. The fees are $320 per academic year. Nonresidents are charged $250 additional each year. The registration for the 1949-1950 session was 291; graduates 75. The last session began Sept. 15, 1949 and ended June 15, 1950. The next class will begin Sept. 11, 1950 and will end June 14, 1951. The Dean is Francis Scott Smyth, M.D.

Stanford University-San Francisco

Stanford University School of Medicine, University Campus, Stanford University; 2398 Sacramento Street, San Francisco. The main buildings are in San Francisco. The laboratories of anatomy, bacteriology and experimental pathology, chemistry and physiology are located on the campus at Stanford University, which is thirty miles southeast of San Francisco adjoining the city of Palo Alto. The post office is Stanford University. Organized in 1908, when by agreement the interests of Cooper Medical College were taken over. The first class graduated in 1913. Coeducational since organization. Three years of collegiate work are required for admission. The quarter plan is in operation. An internship is a requirement for graduation. The average fee for each of the four years is $780. The registration for 1949-1950 was 240; graduates 60. The last session for all classes began Sept. 26, 1949 and ended June 14, 1950. The next session will begin Sept. 25, 1950 and will end June 13, 1951. The Dean is Loren R. Chandler, M.D.

COLORADO

Denver

University of Colorado School of Medicine, 4200 East Ninth Avenue.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911. Coeducational since organization. The entrance requirements are three years of collegiate work. The fees average $525 per academic year. Nonresidents are charged $2,130 additional each year. The registration for 1949-1950 was 277; graduates 67. The last session began Sept. 26, 1949 and ended June 10, 1950. The next session will begin Sept. 25, 1950 and will end June 9, 1951. The Dean is Robert C. Lewis, Ph.D.

CONNECTICUT

New Haven

Yale University School of Medicine, 333 Cedar Street.—Chartered in 1810 as the Medical Institution of Yale College. Organized in 1812; instruction began in 1813; first class graduated in 1814. A new charter in 1879 changed the name to the Medical Department of Yale College. In 1884, the Connecticut Medical Society surrendered such authority as had been granted by the first charter. In 1887, Yale College became Yale University. Coeducational since 1916. The requirements for admission are three years collegiate work. The fees average $750 per academic year. The registration for 1949-1950 was 248; graduates 45. The last session began Sept. 21, 1949 and ended June 6, 1950. The next session will commence Sept. 20, 1950 and will end June 2, 1951. The Dean is C. N. Hugh Long, M.D.

DISTRICT OF COLUMBIA

Washington

Georgetown University School of Medicine, 3900 Reservoir Road, N. W., Zone 7.—Organized in 1851. First class graduated in 1852. The degree of Bachelor of Arts or Bachelor of Science or its equivalent from an approved college of arts and sciences is required for admission of nonveterans, but veterans may be admitted with a minimum of 90 semester hours of credit. The fees average $835.00 per academic year. Registration for 1949-1950 was 414; graduates 82. The last session for freshmen started Sept. 12, 1949 and ended May 27, 1950; the sophomore class started Sept. 19, 1949 and ended May 27, 1950; the junior class started August 30, 1949 and ended May 19, 1950 and the senior class started June 1, 1949 and ended June 12, 1950. The next session for freshmen and sophomores will begin Sept. 11, 1950 and end May 26, 1951; the juniors will be in session from August 28, 1950 to May 18, 1951; the senior session began May 29, 1950 and will end June 11, 1951. The Dean is Rev. Paul A. McNally, S. J., Ph.D.

George Washington University School of Medicine, 1335 H Street, N. W.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name "National Medical College." Classes were graduated in 1826 and in all subsequent years except in 1834-1838 and 1861-1863 inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. in 1904 by an Act of Congress the title of George Washington University was granted to the institution. Coeducational since 1884. Three years of college work is required for admission. The fees average $650 per academic year. The registration for 1949-1950 was 333; graduates 78. The last session began Sept. 19, 1949 and ended May 31, 1950. The next session will begin Sept. 18, 1950 and will end May 30, 1951. The Dean is Walter A. Bloedorn, M.D.

Howard University College of Medicine, 520 W Street, N. W., Zone 1.—Chartered in 1867. Organized in 1869. The first class was graduated in 1871. Coeducational since organization. Negro students compose a majority of those in attendance. The minimum requirements are two years of collegiate work, but practically the bachelor's degree. The course covers four years of thirty-three weeks each. The fees are, respectively: $399; $394; $384; $384. The registration for 1949-1950 was 281; graduates 62. The last session began Sept. 24, 1949 and ended June 9, 1950. The next session will begin Sept. 29, 1950 and will end June 8, 1951. The Dean is Joseph L. Johnson, M.D.

GEORGIA

Atlanta

Emory University School of Medicine.—Organized in 1854 as the Atlanta Medical College. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878), taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the School of Medicine of Emory University in 1915. Three years of collegiate work are required for admission. The course of study is four academic years; 36 weeks each in the first and second years; 40 weeks each in the third and fourth years. The fees for each of the four academic years are $600. The registration for 1949-1950 was 266; graduates 55. The last session for freshmen and sophomores began Sept. 1 and 6, 1949 and ended June 2, 1950. The last session for juniors and seniors began August 1, 1949 and ended June 2, 1950. The next session for freshmen and sophomores will begin Aug. 31 and Sept. 5, 1950 and will end June 2, 1951. The next session for junior and senior classes will begin Aug. 1, 1950 and end on June 2, 1951. The Dean is R. Hugh Wood, M.D.

Augusta

Medical College of Georgia, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. After 1873 it was known as the Medical Department of the University of Georgia. On July 1, 1933, the name was changed to the University of Georgia School of Medicine. On January 18, 1950 it became the Medical College of Georgia. Property transferred to the University in 1911. Classes were graduated in 1833 and all subsequent years except 1862 and 1863. Coeducation was begun in 1920. Three years of college work are required for admission. Fees for 1950-1951, $390.00 per academic year for residents of Georgia, nonresidents, $690.00. Only bona fide residents of Georgia admitted (with exception of A. S. T. and V-12 Program students during World War II). The registration for the 1949-1950 session was 311; graduates 78. The next session will begin Sept. 14, 1950 and will end June 4, 1951. The President is G. Lombard Kelly, M.D.

ILLINOIS

Chicago

Chicago Medical School, 710 South Wolcott Ave.—Founded in 1912 as the Chicago Hospital College of Medicine. In 1919 the name of the institution was changed to The Chicago Medical School. The school moved from its former location to its present site in the Medical Center in 1936. The Chicago Medical School is a nonsectarian, coeducational institution. It is chartered in the State of Illinois as a nonprofit institution. A collegiate degree is required for admission. A hospital internship is a requirement for graduation. The yearly tuition fees are, respectively, $665, $860, $825 and $620. The registration for 1949-1950 was 257; graduates 44. The last session for freshmen began Oct. 3, 1949 and for sophomores July 5, 1949 and ended June 17, 1950; the junior and senior session began Oct. 3, 1949 and ended for seniors June 24, 1950. The junior class will end Sept. 23, 1950. The next session for freshmen, juniors and seniors will begin Oct. 2, 1950 and will end June 16, June 16, 1951 and June 23, 1951. The sophomore class began July 3, 1950 and will end June 16, 1951. The President is John J. Sheinin, M.D.

Northwestern University Medical School, 303 East Chicago Avenue.—Organized in 1859 as the Medical Department of Lind University. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869 but retained the name of Chicago Medical College until 1891, when the present title was taken. Became an integral part of Northwestern University in 1905. Coeducational since 1926. The requirement for admission is three years of collegiate work. The B.S. in medicine degree may be conferred before the end of the senior year. A hospital internship is required for graduation. The total fees are $800 each year. The registration for 1949-1950 was 526; graduates 131. The last session began Sept. 23, 1949 and ended June 12, 1950. The next session will begin Sept. 22, 1950 and will end June 11, 1951. The Dean is Richard H. Young, M.D.

Stritch School of Medicine of Loyola University, 706 South Wolcott Avenue.—Organized in 1915 by acquisition of Bennett Medical College, which had been organized in 1869. Facilities enlarged by the acquisition of Chicago College of Medicine and Surgery. Faculties in basic sciences put on full time basis and assumed name of Loyola University School of Medicine in 1917. Operated as an organic part of Loyola University. Name officially changed to Stritch School of Medicine of Loyola University on April 15, 1948. Coeducational since organization. Three years of collegiate work is required for admission. The fees are $675 a year. The registration for 1949-1950 was 333; graduates 68. The last session for freshmen, sophomores, and juniors began Sept. 26, 1949 and ended June 17, 1950; the session for seniors began Sept. 26, 1949 and ended June 10, 1950. The next session will begin Sept. 25, 1950 and will end June 23, 1951 for the first three classes and June 9, 1951 for seniors. The Acting Dean is John F. Sheehan, M.D.

University of Chicago, The School of Medicine, Fifty-Eighth Street and Ellis Avenue.—Organized in 1924, as a part of the Ogden Graduate School of Science of the University of Chicago. In 1932, when the University of Chicago reorganized its departments, the medical departments were included in the Division of Biological Sciences. The work of the first two years in the medical courses has been given on the University Quadrangles since 1899; but the last two years were offered only at Rush Medical College, which was affiliated with the university until 1927 when actual work in the clinical departments on the campus began. After that time candidates for the degree of Doctor of Medicine could take the work of the first two years on the campus and the work of the third and fourth years either on the campus or at the Rush Medical College. In June 1940 Rush Medical College became affiliated with the University of Illinois College of Medicine. All undergraduate instruction is now given only on the campus of the University of Chicago. A special function of the school is to train people for making contributions to the advancement of medical science. The requirements for admission are three years of collegiate work. The curriculum covers twelve quarters of work. Seventy-two students are admitted to the first year class each year. The tuition fee averages $720. The registration for 1949-1950 was 254; graduates 57. Quarters begin in March, June, September and December of each year. The Dean of the Division of the Biological Sciences is Lowell T. Coggeshall, M.D. All correspondence relating to general policies should be addressed to A. C. Bachmeyer, M.D., Associate Dean of the Division of Biological Sciences, and that pertaining to student affairs, including admission, to F. J. Mullin, Ph.D., Dean of Students.

University of Illinois College of Medicine, 1853 West Polk Street, Zone 12.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897. Relationship with the university was canceled in June 1912, and was restored in March 1913, when the present title was assumed. The staff of the Rush Medical College was incorporated in the University of Illinois College of Medicine in 1942 and at the same time Presbyterian Hospital, Chicago, became a teaching unit of the university. Coeducational since 1898. Three years of collegiate work are required for admission. The B.S. in medicine degree may be conferred at the end of the second year. The fees for residents of Illinois average $292 per academic year; nonresidents pay an additional fee of $150. The registration for the 1949-1950 session was 656; graduates, 161. The last session began Sept. 27, 1949 and ended June 17, 1950. The next session will begin Sept. 25, 1950 and will end June 16, 1951. The Dean is Stanley W. Olson, M.D.

INDIANA

Bloomington-Indianapolis

Indiana University School of Medicine, Bloomington; 1040 West Michigan Street, Indianapolis.—Organized in 1903 but did not give all the work of the first two years of the medical course until 1905. In 1907 by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879) merged into it. The first class was graduated in 1908. Coeducational since organization. The B.S. degree in anatomy and physiology is conferred. Three years of college work are required for admission. The work of the first two semesters is given at Bloomington; the remainder of the work at Indianapolis. Regular fee for two semesters of work is $221 for residents of Indiana and $426 for nonresidents. The registration for the 1949-1950 session was 492; graduates 93. The last session began Sept. 18, 1949 and ended June 12, 1950. The next session will begin Sept. 25, 1950 and will end June 18, 1951. The Dean is John D. Van Nuys, M.D., Indianapolis.

IOWA

Iowa City

State University of Iowa College of Medicine, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. Coeducational since 1870. Three years of collegiate work are required for admission. The B.A. degree in the combined course of liberal arts and medicine is conferred. The tuition fee is $244 each year for

residents of Iowa and $554 for nonresidents. The registration for 1949-1950 was 338; graduates 70. The last session began Sept. 22, 1949 and ended June 9, 1950. The next session will begin Sept. 21, 1950 and will end on June 8, 1951. The Chairman of the Executive Committee is Willis M. Fowler, M.D.

KANSAS

Lawrence-Kansas City

University of Kansas School of Medicine, Lawrence; 39th Street and Rainbow Boulevard, Kansas City.—Organized in 1880. It offered only the first two years of the medical course until 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. Absorbed Kansas Medical College of Topeka in 1913. The first class graduated in 1906. The clinical courses are given in Kansas City. At present the first year and one half of the medical course is given on the University campus at Lawrence, Kansas. The class is transferred to the Kansas City, Kansas, campus in the middle of the second year, where the balance of the course is given. Coeducational since 1880. The requirement for admission is three years of collegiate work. The fees are $325 per year; the nonresident fees are $625 per year. The registration for 1949-1950 was 348; graduates 83. The last session began June 13, 1949 and ended May 27, 1950. The 1950 freshman class began June 12, 1950 and the sophomore class will begin on the same date; both ending May 26, 1951. The junior and senior classes began June 5, 1950 and will end May 26, 1951. Three-fourths of each junior and senior class is in school all the time while one-fourth is on vacation (juniors) or preceptorship (seniors) each quarter. The Dean is Franklin D. Murphy, M.D., Kansas City.

KENTUCKY

Louisville

University of Louisville School of Medicine, 101 West Chestnut Street, Zone 2.—Organized in 1837 as Louisville Medical Institute. The first class graduated in 1838, and a class graduated each subsequent year except 1863. In 1846 the name was changed to University of Louisville Medical Department. In 1907 it absorbed the Kentucky University Medical Department; in 1908, the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. In 1922 it changed its name to the University of Louisville School of Medicine. Coeducational since organization. Three years of collegiate work are the minimum requirements for admission. Fees are $550 for residents of Louisville and Jefferson County and $650 for nonresidents, per school year. The registration for 1949-1950 was 367; graduates 90. The school year is divided into two semesters and students are accepted for matriculation only at the beginning of the first semester. The last session began Sept. 14, 1949 and ended June 10, 1950. The next session begins on Sept. 12, 1950 and will end on June 2, 1951. The Dean is J. Murray Kinsman, M.D.

LOUISIANA

New Orleans

Louisiana State University School of Medicine, 1542 Tulane Avenue, Zone 12.—Organized January 1931 as Louisiana State University Medical Center. Present title in 1939. Coeducational. First session began in October 1931 with students of first and third years. Course covers four sessions of not less than 36 weeks each. A minimum of three years' collegiate work is required for admission. Total fees, $120 each year for residents of Louisiana; additional tuition of $400 each year for nonresidents. The registration for 1949-1950 was 391; graduates 68. The last session began Sept. 6, 1949 and ended June 3, 1950. The next session will begin Sept. 5, 1950 and end June 2, 1951. The Dean is William W. Frye, M.D.

Tulane University of Louisiana School of Medicine, 1430 Tulane Avenue. —Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years except 1863-1865, inclusive. It became the Medical Department of the Tulane University of Louisiana in 1884. Present title in 1913. Coeducational since 1915. A minimum of three years of collegiate work is required for admission. Total fees average $650 per academic year. The registration for the 1949-1950 session was 505; graduates 118. The last session began on August 31, 1949 and ended on June 6, 1950. The next session will begin Sept. 9, 1950 and will end June 5, 1951. The Dean is Maxwell E. Lapham, M.D.

MARYLAND

Baltimore

Johns Hopkins University School of Medicine, 710 North Washington Street. The nucleus of a medical faculty was constituted in 1883. Systematic postgraduate instruction in pathology and bacteriology was begun in 1886. School was fully organized and opened in 1893. The first class graduated in 1897. Coeducational since organization. The requirement for admission is a college degree. The course extends over four years of eight and one-half months each. The fees averaged $828 per academic year. The registration for 1949-1950 was 296; graduates 71. The last session began on Oct. 3, 1949 and ended June 13, 1950. The next session will begin on Oct. 2, 1950 and will end June 12, 1951. The Dean is Alan M. Chesney, M.D.

University of Maryland School of Medicine and College of Physicians and Surgeons, Lombard and Greene Streets, Zone 1.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine; Baltimore Medical College was merged with it in 1913. In 1915 the College of Physicians and Surgeons of Baltimore was merged and the present name assumed. Coeducational since 1918. Three years of college work are required for admission. The tuition fees average $513 for residents of the state; for nonresidents $150 additional. The registration for 1949-1950 was 362; graduates 80. The last session began Sept. 22, 1949 and ended June 10, 1950. The next session will begin Sept. 21, 1950 and will end June 9, 1951. The Dean is H. Boyd Wylie, M.D.

MASSACHUSETTS

Boston

Boston University School of Medicine, 80 East Concord Street, Zone 18.—Organized in 1873 as a homeopathic institution. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class was graduated in 1874. Became non-sectarian in 1918. Coeducational since organization. Applicants are required to present a minimum of three years of premedical work. Total fees average $800 per year. The registration for 1949-1950 was 255; graduates 53. The last session for freshmen, sophomores and juniors began Sept. 12, 1949 and ended May 27, 1950. The last senior class began June 13, 1949 and ended June 5, 1950. The present senior class began June 12, 1950 and will end June 11, 1951. All other classes will be enrolled Sept. 11, 1950 and the session will end May 26, 1951. The Dean is James M. Faulkner, M.D.

Harvard Medical School, 25 Shattuck Street, Zone 15.—Organized in 1782. The first class graduated in 1788. Three years of collegiate work is required for admission. The fees average $830. The registration for 1949-1950 was 500; graduates 133. The last session began Sept. 26, 1949 and ended on June 22, 1950. The next session for freshmen, sophomores and juniors will begin Sept. 25, 1950 and will end June 21, 1951. The senior class began on June 5, 1950 and will end June 21, 1951. The Dean is George Packer Berry, M.D.

Tufts College Medical School, 136 Harrison Avenue, Zone 11.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. Coeducational since 1894. A bachelor's degree is required for admission. Enrolment is generally limited to residents of the New England states. The course covers four years. Total fees for each of the four years are, respectively, $811, $806, $806, $816. The registration for 1949-1950 was 403; graduates 102. The last session for freshmen, sophomores and juniors began Sept. 21, 1949; for seniors June 13, 1949, and all classes ended June 11, 1950. The present session began for the seniors on June 12, 1950 and for the other classes will begin Sept. 20, 1950 and will end June 10, 1951. The Dean is Dwight O'Hara, M.D.

MICHIGAN

Ann Arbor

University of Michigan Medical School.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed in 1915. Coeducational since 1870. The entrance requirements are three years of collegiate work. The fees average $290 per academic year; nonresidents $550 a year. The registration for 1949-1950 was 493; graduates 92. The last session began Sept. 26, 1949 and ended June 17, 1950. The next session will begin Sept. 25, 1950 and will end June 16, 1951. The Dean is A. C. Furstenberg, M.D.

Detroit

Wayne University College of Medicine, 1512 St. Antoine Street, Zone 26. —Organized as the Detroit College of Medicine in 1885 by consolidation of the Detroit Medical College (organized in 1868) and the Michigan College of Medicine (organized in 1879). Reorganized with the title of Detroit College of Medicine and Surgery in 1913. The first class graduated in 1869. In 1918 it became a municipal institution under the control of the Detroit Board of Education. In 1934 the name was changed by action of the Detroit Board of Education to Wayne University College of Medicine, as a part of the program of consolidation of the Detroit city colleges into a university system. Coeducational since 1917. Entrance requirement is three years in an accredited college or university. Until further notice, enrolment is limited to residents of the State of Michigan. The fees average $525 for the school year. The registration for 1949-1950 was 255; graduates 58. The last session began Sept. 12, 1949 and ended June 10, 1950. The next session will begin Sept. 11, 1950 and will end June 9, 1951. The Dean is Gordon H. Scott, Ph.D.

MINNESOTA

Minneapolis

University of Minnesota Medical School, Zone 14.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery and reorganized in 1888 by absorption of the St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, orgahized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. Coeducational since organization. The entrance requirements are three years of university work. Students are required to meet the requirements for a degree of B.S. or B.A. before receiving the degree of Bachelor of Medicine (M.B.), which is granted at the end of the course. The M.D. degree is conferred after a year of intern work, of advanced laboratory work or of public health work has

been completed. Total fees are $310.55 per academic year for residents and $572 for nonresidents. The registration for 1949-1950 was 458; graduates, 87. The last session began Sept. 26, 1949 and ended June 16, 1950. The next session will begin Oct. 2, 1950 and will end July 28, 1951. The school year of the first three years consists of fall and winter quarters of approximately 11 weeks and a spring quarter of approximately 16 weeks; in the senior year the spring quarter is 11 weeks in length and graduation is in June. The Dean of Medical Sciences is Harold S. Diehl, M.D.

MISSOURI

St. Louis

St. Louis University School of Medicine, 1402 South Grand Boulevard, Zone 4.—Organized in 1901 as the Marion-Sims-Beaumont Medical College by union of Marion-Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the Medical School of St. Louis University in 1903. The completion of the equivalent of four years of college study is the minimum admission requirement. The fees average $814.00 per year. The registration for 1949-1950 was 456; graduates 103. The last session began Sept. 20, 1949 and ended June 1, 1950. The next session will begin Sept. 19, 1950 and will end June 1, 1951. The Dean is Melvin A. Casberg, M.D.

Washington University School of Medicine, Kingshighway and Euclid Avenue, Zone 10.—Organized in 1842 as the Medical Department of St. Louis University. The first class graduated in 1843. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. Coeducational since 1918. Three years of college work is required for admission. The B.S. degree in medicine is conferred at the end of the third or fourth year. The fees average $800. The registration for 1949-1950 was 356; graduates 85. The last session began on Sept. 12, 1949 and ended June 6, 1950. The next session will begin on Sept. 11, 1950 and will end on June 5, 1951. The Dean is Robert A. Moore, M.D.

NEBRASKA

Omaha

Creighton University School of Medicine, 302 North Fourteenth Street, Zone 2.—Organized in 1892 as the John A. Creighton Medical College. The first class graduated in 1893. Present title 1921. Coeducational since organization. Three years of collegiate work is required for admission. The tuition fees average $700 per academic year. The registration for 1949-1950 was 283; graduates 63. The last session began Sept. 23, 1949 and ended June 1, 1950. The next session will begin Sept. 22, 1950 and will end May 31, 1951. The Dean is Percy J. Carroll, M.D.

University of Nebraska College of Medicine, Forty-Second Street and Dewey Avenue, Zone 5.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. The University of Nebraska College of Medicine was established in Lincoln in 1883, and in 1902 the Omaha Medical College became a part of the University of Nebraska and has continued with the present title College of Medicine, University of Nebraska. The instruction of the first two years was given at Lincoln and of the last two years at Omaha until 1913, when the work of all four years was transferred to Omaha. Coeducational since 1882. Three years of college work are required for admission. The B.S. degree in medicine is conferred at the end of the second year. The fees average $450 per academic year; nonresidents are charged an additional $150. The registration for 1949-1950 was 334; graduates 76. The last session for seniors began Sept. 12, 1949, and ended May 27, 1950. The last session for freshmen, sophomores and juniors began Sept. 12, 1949, and ended June 3, 1950. The next session will begin September 11, 1950, and will end June 2, 1951. The Dean is Harold C. Lueth, M.D.

NEW YORK

Albany

Albany Medical College, 47 New Scotland Avenue.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed educational control. Coeducational since 1915. The requirement for admission is three years of college work. The fees average $775 per academic year. The registration for 1949-1950 was 189; graduates 52. The last session began on Sept. 26, 1949 for the freshmen and sophomores and ended on June 15, 1950 for the freshmen and on June 8, 1950 for the sophomores; the last session for the juniors began on Sept. 12, 1949 and ended on May 20, 1950, for the seniors June 1, 1949 to May 31, 1950. The present senior year began on June 1, 1950 and will end May 31, 1951. The next session for the juniors will begin on Sept. 11, 1950 and will end on May 19, 1951; for the freshmen and sophomores the year will begin on September 25, 1950 and will end on June 16, 1951. The Dean is R. S. Cunningham, M.D.

Brooklyn

State University of New York, State University Medical Center at New York City, College of Medicine, 350 Henry Street, Zone 2.—Originally organized in 1858 as the collegiate department of The Long Island College Hospital. The first class was graduated in 1860 and the last class in 1930. Was chartered in 1930 as Long Island College of Medicine with the first class graduated in 1931 and the last in 1949. It was merged with the State University of New York on April 5, 1950, and the first class under the University was graduated in June 1950. It is coeducational. Three years of collegiate work, including specified courses, are required for admission. The fees are $715 per academic year. The registration for 1949-1950 was 442; graduates 92. The last session for seniors began Sept. 12, 1949 and ended June 3, 1950. The last session for freshmen, sophomores and juniors began on Sept. 19, 1949 and ended on June 10, 1950. The next session begins for freshmen, sophomores and juniors on Sept. 18, 1950 and ends June 9, 1951. For seniors the next session will begin Sept. 11, 1950 and will end June 2, 1951. The President is Jean A. Curran, M.D. The Dean is Duncan W. Clark, M.D.

Buffalo

University of Buffalo School of Medicine, 24 High Street.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. Coeducational since organization. The minimum requirement for admission is three years of collegiate work including certain prescribed science subjects. The fees average $628. The registration for 1949-1950 was 279; graduates 72. The last session began on September 19, 1949 and ended June 10, 1950 for freshmen and sophomores, on June 17, 1950 for juniors, and on May 27, 1950 for seniors. The next session will begin Sept. 25, 1950 and end June 16, 1951 for freshmen, sophomores and juniors, and will begin on Sept. 11, 1950 and end on June 9, 1951 for seniors. The Dean is Stockton Kimball, M.D.

New York

Columbia University College of Physicians and Surgeons, 630 West One Hundred and Sixty-Eighth Street.—The medical faculty of Columbia College, then known as King's College, was organized in 1767. Instruction was interrupted by the War of the Revolution. The faculty was reestablished in 1792 and merged in 1814 with the College of Physicians and Surgeons, which had received an independent charter in 1807. In 1860 the College of Physicians and Surgeons became the Medical Department of Columbia College. This merger became permanent by legislative enactment in 1891. Columbia College became Columbia University in 1896. The medical school has been coeducational since 1917. Three years of collegiate work are required for admission. Fees average $800 per academic year. The registration for 1949-1950 was 442; graduates 104. The last session began on June 6, 1949 and June 1, 1949 for juniors and seniors, respectively; and ended on June 3, 1950. The last session for freshmen and sophomores began on Sept. 12, 1949 and ended June 3, 1950. The present session began on June 5, 1950 and June 1, 1950 respectively, for the juniors and seniors and will end June 2, 1951, and will begin on Sept. 11, 1950 for the freshmen and sophomores and will end June 2, 1951. The Dean is Willard C. Rappleye, M.D.

Cornell University Medical College, 1300 York Avenue.—Organized in 1898. Coeducational since organization. First year teaching was given formerly to approximately one third of the class at Ithaca but in 1938 this division was discontinued and all instruction is now in New York City. All students matriculated must be graduates of approved colleges or scientific schools or seniors *in absentia* who will receive the bachelor degree from their college on successful completion of the first year of the medical course. The fees average $825 a year. The registration for 1949-1950 was 326; graduates 78. The last session began for senior students July 11, 1949 and ended June 14, 1950. The freshman, sophomore, and junior classes began Sept. 15, 1949, and ended June 14, 1950. The present session for seniors began on July 10, 1950, and for the remaining three classes on Sept. 14, 1950, and will end June 12, 1951. The Dean is Joseph C. Hinsey, Ph.D.

New York

New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York 9.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title New York Homeopathic Medical College was assumed in 1869; the title New York Homeopathic Medical College and Hospital in 1887; the title New York Homeopathic Medical College and Flower Hospital in 1908; the title New York Medical College and Flower Hospital in 1936; the present title of New York Medical College, Flower and Fifth Avenue Hospitals, June 22, 1938. The first class graduated in 1861. Coeducational since 1919. Three years of college work is the minimum requirement for admission but a degree is preferred. The fees average $750 per academic year. The registration for 1949-1950 was 466; graduates 98. The last session began Sept. 19, 1949 and ended June 7, 1950. The next session will begin Sept. 18, 1950 and will end June 6, 1951. The President and Dean is J. A. W. Hetrick, M.D.

New York University College of Medicine, 477 First Avenue, Zone 16. This is the undergraduate medical college of the New York University-Bellevue Medical Center which comprises also the Post-Graduate Medical School and the University Hospital.—The Medical Department of New York University (then called the University of the City of New York) was organized in 1841 as the University Medical College. In 1898 it united with the Bellevue Hospital Medical College, organized in 1861, under the name of University and Bellevue Hospital Medical College. In 1935 the name was changed to New York University College of Medicine. In 1947 the charter of the University and the statues were amended, establishing the New York University-Bellevue Medical Center, which includes the College of Medicine. Coeducational since 1919. Entrance requirements give preference to those who have completed not less than three full years in an approved college of arts and sciences. The fees average $750 per academic session. The registration for 1949-1950 was 501; graduates 118. The last session began September 19, 1949 for freshmen, sophomores, juniors and seniors and ended May

20, 1950 for freshmen, sophomores, and June 10th for juniors and May 13th for seniors. The next session begins September 18 for all classes and ends May 19, 1951 for freshmen, sophomores, and June 9 for juniors and May 12 for seniors. The Dean is Currier McEwen, M.D.

Rochester

University of Rochester School of Medicine and Dentistry, 260 Crittendon Boulevard, Zone 7.—Organized in 1925 as the Medical Department of the University of Rochester. Coeducational since organization. Three years of collegiate work are required for admission. The fees are $600 per academic year. The registration for 1949-1950 was 271; graduates 67. The last session began Sept. 19, 1949 and ended June 17, 1950. The next session will begin on Sept. 18, 1950 and will end on June 9, 1951. The Dean is George H. Whipple, M.D.

Syracuse

State University of New York, Medical Center at Syracuse University, College of Medicine, 766 Irving Avenue, Zone 10.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Assumed title Syracuse University College of Medicine in 1875, when a compulsory three year graded course was established. The College of Medicine was merged with the State University of New York on June 26, 1950 when the present title was assumed. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. Coeducational since organization. Three years of a recognized college course are required for admission. The fees average $800 per academic year. The registration for 1949-1950 was 209; graduates 38. The last session began Sept. 6, 1949 and ended June 5, 1950. The next session for all classes will begin Sept. 5, 1950 and will end June 4, 1951. The Dean is H. G. Weiskotten.

NORTH CAROLINA

Durham

Duke University School of Medicine.—Organized in 1930. The first class was admitted Oct 1, 1930. Coeducational. The premedical requirement is three years of college work. The academic year consists of two semesters in the first year and three quarters each in the sophomore, junior and senior years. There is no summer quarter between the first and second year, but in the two clinical years the subjects of the autumn, winter and spring terms are repeated in the summer quarter. This accelerated schedule is optional, and students may take the two semesters of their first year, and three quarters in each of their subsequent years, and receive their certificates in four calendar years, or if they receive permission from the curriculum committee they may at the end of their second year take the clinical quarters given during the summers and receive their certificates in three and one quarter calendar years. The B.S. degree in medicine may be conferred for special work after six quarters. Students are urged to spend three years in hospital or laboratory work after graduation and must give assurance satisfactory to the executive committee that they will spend at least two years. Active duty with the Army, Navy or Public Health Service can replace the second year. The fees are $750 for three quarters. The registration for 1949-1950 was 297; graduates 72. During 1950 the quarters begin Jan. 3, March 27, July 5, Oct. 2, and end March 18, June 10, Sept. 16 and Dec. 16. The next freshman class will be enrolled Oct. 2, 1950 and will end June 9, 1951. The Dean is Wilburt C. Davison, M.D.

Winston-Salem

Bowman Gray School of Medicine of Wake Forest College, Zone 7.—Organized in 1902 at Wake Forest as a school offering only the first two years of the curriculum. In 1941 the school was moved to Winston-Salem and expanded to a complete four year medical school under its present name. Coeducational. Three years of college work is required for admission. Clinical departments operate four quarters in the year; however, the plan of operation makes it possible for students to be out of school during one quarter of each of the clinical years for research, for study elsewhere, or for earning money to help defray expenses for their education. Tuition is $600 per school year. The registration for 1949-1950 was 211; graduates 41. The last session for the freshman class began Oct. 3, 1949; sophomores, Oct. 3, 1949; juniors, July 11, 1949, and seniors, July 11, 1949, and ended for freshmen, sophomores, and juniors on June 10, 1950, and for seniors, June 3, 1950. The present junior and senior classes began July 10, 1950, and will end June 9, 1951. The next freshman and sophomore classes will begin Oct. 2, 1950, and will end June 9, 1951. The Dean is C. C. Carpenter, M.D.

OHIO

Cincinnati

University of Cincinnati College of Medicine, Eden and Bethesda Avenues.—Organized in 1909 by the union of the Medical College of Ohio (founded in 1819) with the Miami Medical College (founded in 1852). The Medical College of Ohio became the Medical Department of the University of Cincinnati in 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged with the University when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. Present title assumed in 1915. Coeducational since organization. Three years of collegiate work are required for admission. Liberal arts students of the University of Cincinnati may enroll for the seven year combined liberal arts and medical program. The B.S. degree is granted on the joint recommendation of the faculties of the College of Liberal Arts and Medicine at the end of the first medical year. Tuition is as follows: for legal residents of Cincinnati $525 a year plus breakage fees ($125 additional for those not legal residents). The registration for 1949-1950 was 337; graduates 76. The last session for freshmen, sophomores, juniors and seniors began Sept. 26, 1949 and ended June 3, 1950. The next session for all classes will begin Sept. 25, 1950 and will end June 2, 1951. The Dean is Stanley Dorst, M.D.

Cleveland

Western Reserve University School of Medicine, 2109 Adelbert Road, Zone 6.—Organized in 1843 as the Cleveland Medical College in cooperation with Western Reserve College. The first class graduated in 1844. The school assumed the present title in 1881. In 1910 the Cleveland College of Physicians and Surgeons was merged. Coeducational since 1919. Students are required to have three years of college work for admission; four years preferred. The fees average $800 per academic year. The registration for 1949-1950 was 332; graduates 91. The last session began Sept. 21, 1949, for freshmen and sophomores, and ended June 10, 1950. For juniors the last session began Sept. 14, 1949, and ended June 3, 1950. For seniors the last session began Aug. 29, 1949, and ended June 14, 1950. The next session for freshmen and sophomores will begin Sept. 20, 1950, and will end June 9, 1951. For juniors the session dates will be Sept. 13, 1950 to June 2, 1951; and for seniors from Aug. 28, 1950 to June 13, 1951. The Dean is Joseph T. Wearn, M.D.

Columbus

Ohio State University College of Medicine, Neil and Eleventh Avenues, Zone 10.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized in 1847 by charter granted by the State Legislature changing the name from Willoughby Medical College, which was chartered March 3, 1834) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. Coeducational since organization. Three years of collegiate work are required for admission. Tuition fees average $480 per academic year and $225 additional for nonresidents. The registration for 1949-1950 was 318; graduates 68. The last session began on Sept. 27, 1949 and ended June 9, 1950. The next session will begin Oct. 3, 1950, and end June 8, 1951. The Dean is Charles A. Doan, M.D.

OKLAHOMA

Oklahoma City

University of Oklahoma School of Medicine, 800 North East Thirteenth Street, Zone 4.—Organized in 1900. Until 1910 gave only the first two years of the medical course at Norman, Oklahoma, after which a clinical department was established at Oklahoma City through consolidation with the Medical School of Epworth University. The first class graduated in 1911. Coeducational since organization. A new medical school building and a second teaching hospital became available in 1928, and since September of that year the entire four year course has been given in Oklahoma City. Prerequisites for admission are three years—90 semester hours. The fees for residents of Oklahoma are $350; nonresidents, $700. The registration for 1949-1950 was 277; graduates 74. The last session began Sept. 19, 1949 and ended June 5, 1950. The next session will begin Sept. 18, 1950 and will end June 4, 1951 for the first three classes. The senior session began June 19, 1950 and will end June 4, 1951. The Dean is Mark R. Everett, Ph.D.

OREGON

Portland

University of Oregon Medical School, 3181 S. W. Sam Jackson Park Road, Zone 1.—Organized in 1887. The first class graduated in 1888, and a class graduated each subsequent year except 1898. The Willamette University Medical Department was merged in 1913. Coeducational since organization. Entrance requirement is three years of collegiate work. The total fees are $373.50 a year for residents of Oregon and $150 a year additional for nonresidents, plus a breakage deposit of $15 a year for the first two years and $10 a year for the last two years. The registration for 1949-1950 was 274; graduates 58. The last session began October 3, 1949 and ended June 16, 1950. The next session will begin October 2, 1950 and will end June 15, 1951. The dean is D. W. E. Baird, M.D.

PENNSYLVANIA

Philadelphia

Hahnemann Medical College and Hospital of Philadelphia, 235 North Fifteenth Street, Zone 2.—Incorporated in 1848 as The Homeopathic Medical College of Pennsylvania. In 1869, the school and a corporation known from 1853 to 1867 as The Washington Medical College of Philadelphia and thereafter as The Hahnemann Medical College of Philadelphia were merged under the latter title. Assumed present title in 1885. The first class graduated in 1849. Coeducational beginning with 1941-1942 session. Three years of collegiate work in an approved college of arts and sciences are required for admission. Fees are respectively $755, $750, $750, $775. The registration for 1949-1950 was 342; graduates 72. The last session began for all students Sept. 12, 1949, and ended for seniors June 15, 1950, for juniors June 9, 1950, for sophomores and freshmen June 2, 1950. The next session for all classes will begin Sept. 11, 1950 and will end June 2, 1951 for freshmen and sophomores, June 8, 1951 for juniors, and June 14, 1951 for seniors. The Dean is Charles L. Brown, M.D.

Jefferson Medical College of Philadelphia, 1025 Walnut Street.—Organized in 1825 as the Medical Department of Jefferson College, Canonsburg, Pa. It was chartered with its present title in 1838. Classes have been graduated annually beginning in 1826. In 1838 a separate university charter was granted without change of title, since which time it has continued under the direction of its board of trustees. For the class entering in 1951 the minimum entrance requirement will be three years of college work. The tuition fee is $700 a year. The registration for 1949-1950 was 636; graduates 152. The last session began for all classes on Sept. 12, 1949 and ended for freshmen on June 7, 1950; for sophomores on June 10, 1950, for juniors on June 7, 1950 and for seniors on May 29, 1950. Graduation was June 9, 1950. The next session will begin for all classes on Sept. 11, 1950. The Dean is Wm. Harvey Perkins, M.D.

Temple University School of Medicine, 3400 North Broad Street, Zone 40.—Organized in 1901. The first class graduated in 1904. Coeducational since organization. Three years of collegiate work are required for admission. The fees average $710 per academic year. The registration for 1949-1950 was 480; graduates 100. The last session began Sept. 19, 1949 and ended June 15, 1950. The next session will begin Sept. 8, 1950 and will end June 14, 1951. The Dean is William N. Parkinson, M.D.

University of Pennsylvania School of Medicine, Thirty-Sixth and Pine Streets.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772 and 1775-1779, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title was adopted in 1909. It granted the first medical diploma issued in America. In 1916, it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. Coeducational since 1914. Three years of collegiate work is required for admission. The tuition fee is $800, with a deposit fee of $15, a general fee including student health of $15 and a matriculation fee of $5. The registration for 1949-1950 was 487; graduates 114. The last session began Sept. 26, 1949 and ended June 14, 1950. The next session will begin Sept. 25, 1950 and will end June 13, 1951. The Dean is John McK. Mitchell, M.D.

Woman's Medical College of Pennsylvania, Henry Avenue and Abbottsford Road, Zone 29.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. At least three years of collegiate work are required for admission and candidates with a degree are given preference. The curriculum covers four years of thirty-six weeks each. Total fees are $710 yearly. The registration for 1949-1950 was 176; graduates 34. The last session began Sept. 7, 1949 and ended June 15, 1950. The next session will begin Sept. 11, 1950 and will end June 14, 1951. The Dean is Marion Fay, Ph.D.

Pittsburgh

University of Pittsburgh School of Medicine, 3941 O'Hara Street.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. Coeducation since 1899. Entrance requirements are three years of collegiate work. The total fees are $556 each year. The registration for 1949-1950 was 334; graduates 71. The last session began Sept. 12, 1949 and ended June 14, 1950. The next session will begin on Sept 11, 1950 and will end June 13, 1951. The Dean is William S. McElroy, M.D.

SOUTH CAROLINA

Charleston

Medical College of the State of South Carolina, 16 Lucas Street, Zone 16.—Organized 1823 as the Medical College of South Carolina. The first class graduated in 1825. In 1832 a medical college bearing the present title was chartered and the two schools continued as separate institutions until they merged in 1838. Classes were graduated in all years except 1862 to 1865, inclusive. Coeducational from 1895 to 1912, when privileges for women were withdrawn, being restored in 1917. At least three years of collegiate work are required for admission. The total fees average $425 each year for residents of South Carolina and $625 for nonresidents of the state. The registration for 1949-1950 was 231; graduates 57. The last session began on Sept. 22, 1949 and ended June 1, 1950. The next session will begin on Sept. 28, 1950 and will end June 7, 1951. The President is Kenneth M. Lynch, M.D.

TENNESSEE

Memphis

University of Tennessee College of Medicine, 847 Union Avenue, Zone 3.—Organized in 1876, at Nashville as Nashville Medical College. First class graduated in 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee in 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913, Lincoln Memorial University Medical Department was merged in 1914. Coeducational since 1911. Two years of collegiate work are required for admission. The B.S. degree is conferred on students completing the science-medical curiculum of the University. The fees are $175 quarterly. For residents of the state the charge is reduced $50 each quarter. The registration for 1949-1950 was 578; graduates 143. During the next academic year the quarters begin September, January, March and July. The Dean is O. W. Hyman, Ph.D.

Nashville

Meharry Medical College, Eighteenth Avenue North and Meharry Boulevard, Zone 8 (For Negro Youth).—Organized in 1876 as the Meharry Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1915. Coeducational since 1876. Two years of college work in a school of liberal arts are required for admission. Tuition and fees are: first year $515; second year $505; third year $485; fourth year $495. The curriculum covers four academic years of thirty-four weeks each. In September 1942, Meharry Medical College instituted the quarter system. The registration for 1949-1950 was 245; graduates 60. The last session began on Sept. 26, 1949 and ended on June 5, 1950. The next session begins on Sept. 25, 1950 and will end on June 4, 1951. The Director of Medical Education is Murray C. Brown, M.D.; the Dean is Michael J. Bent, M.D.

Vanderbilt University School of Medicine, Twenty-First Avenue South at Edgehill, Zone 4.—The school was founded in 1874. The first class graduated in 1875. Coeducational since 1925. For matriculation, students must be graduates of collegiate institutions of recognized standing or seniors in absentia, who will receive the bachelor degree from their college after having completed successfully one year of work in the school of medicine. The course covers four academic years of nearly nine months each. The fees average $615 per academic year. The registration for 1949-1950 was 205; graduates 48. The last session began Sept. 26, 1949 and ended June 4, 1950. The next session will begin Sept. 25, 1950 and will end June 10, 1951. The Dean is John B. Youmans, M.D.

TEXAS

Dallas

Southwestern Medical School of the University of Texas, 2211 Oak Lawn.—Organized in 1943. The first class graduated March 20, 1944. Coeducational since organization. Became a branch of the University of Texas, Sept. 1, 1949. The medical college is operated on the regular program offering three terms of twelve weeks each per academic year. The tuition fees for residents average $125 per year. The nonresident fee is $300 per year. Three years of college work is required for admission. Registration 1949-1950 was 281; graduates 56. The last session began Sept. 7, 1949, and ended June 5, 1950. Next session will begin Sept. 1, 1950, and will end June 4, 1951. The Dean is Carl A. Moyer, M.D.

Galveston

University of Texas School of Medicine, 900 Strand St.—Organized in 1890. The first class graduated in 1892. Coeducational since organization. Three years of college work is required for admission to the freshman class matriculating in September 1950, but students are urged to complete the baccalaureate degree if possible prior to matriculation. The fees average $113 per academic year, including health fees for medical care and hospitalization. The registration for 1949-1950 was 452. Graduates on June 2, 1950 were 93. The last session began on Sept. 13, 1949 and ended on June 3, 1950. The next freshman class will matriculate on Sept. 12, 1950, and the sophomore, junior, and senior classes will matriculate on Sept. 18, and all classes will end June 2, 1951. The Vice President is Chauncey D. Leake, Ph.D., and D. Bailey Calvin, Ph.D., is Dean of Student and Curricular Affairs.

Houston

Baylor University College of Medicine, Texas Medical Center.—Organized in 1900 at Dallas as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University. It acquired the charter of Dallas Medical College in 1904. The school was moved to Houston in 1943. Coeducational since organization. The first class graduated in 1903. Entrance requirements are three years of collegiate work. The course covers four years of eight months each. The fees are respectively $656, $646, $631, $656. The registration for 1949-1950 was 327; graduates 73. The last session began Oct. 3, 1949 and ended June 12, 1950. The next session will begin Oct. 2, 1950 and will end June 11, 1951. The Dean is W. H. Moursund, M.D.

UTAH

Salt Lake City

University of Utah College of Medicine.—Organized in 1906. Coeducational since organization. Four year curiculum establish March, 1943. Three years of collegiate work are required for admission. The University of Utah has accepted in principle the policy of acceleration by graduating a class in three calendar years (4 academic years), but will admit only one class annually. The next freshman class will be admitted in June, 1951. All subsequent freshman classes will begin in June of each year. Classes are scheduled during four academic quarters (11-12 weeks) each calendar year. An entering first-year student may be graduated in 12 academic quarters (3 calendar years) after date of admission; attendance during the summer quarter being required. Applications for admission (complete) must be submitted 9 months prior to opening date. The fees for each quarter average $151.50 (resident); there is a non-resident fee of $50 each quarter. The registration for 1949-1950 was 200; graduates 52. The last session began for freshmen June, 1949 and ended March 1951. The present session for freshmen began June 19, 1950 and will end in March, 1951. The present session for sophomores began March 1950 and will end Dec. 1950. The present session for juniors began January 1950 and will end Sept. 1950. The present session for seniors will begin Sept. 1950 and end June 1951. The Acting Dean is H. L. Marshall, M.D. until Nov. 1, 1950 when John E. Bowers, M.D., will asume deanship duties.

VERMONT

Burlington

University of Vermont College of Medicine, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. Coeducational since 1920. Three years of college work are required for admission. For residents of Vermont the tuition fee averages $550 per session. Nonresidents are charged an additional $150 each session. A $25 fee is charged for the doctor's degree. Registration for 1949-1950 was 162; graduates 36. The last session for freshmen, sophomores and juniors began Sept. 17, 1949 and ended June 12, 1950. The last senior class began July 5, 1949 and graduated June 12, 1950. The present senion class began July 5, 1950; the next freshman, sophomore and junior classes will begin Sept. 9, 1950 and all classes will end June 11, 1951. The Dean is William Eustis Brown, M.D.

VIRGINIA

Charlottesville

University of Virginia Department of Medicine.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. Coeducational since the session of 1920-1921. Three years of college work are required for admission. For residents of Virginia the tuition and other required fees are $440 per academic year; for nonresidents, $840. The registration for 1949-1950 was 271; graduates 59. The last session began Sept. 14, 1949 and ended June 12, 1950. The next session will begin Sept. 18, 1950 and will end June 11, 1951. The Dean is Vernon W. Lippard, M.D.

Richmond

Medical College of Virginia, Twelfth and Marshall Streets.—Organized in 1838 as the Medical Department of Hampden-Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. Coeducational since 1918. Classes were graduated in 1839 and in all subsequent years. Three years of collegiate work, as a minimum, are required for admission. Preference, however, is given to applicants with a baccalaureate degree. Fees average $510 per academic year. Nonresidents are charged an additional $200 each year. The registration for 1949-1950 was 354; graduates 92. The last session began Sept. 12, 1949 for second, third and fourth year classes and ended June 6, 1950. The last session for the first year class began Sept. 8, 1949 and ended June 6, 1950. The subsequent session will begin Sept. 7, 1950 for the first year class and Sept. 11, 1950 for the second, third and fourth year classes and will end June 5, 1951. The Dean is Harvey B. Haag, M.D. The Associate Dean and Chairman of the Admissions Committee is Mr. George W. Bakeman.

WASHINGTON

Seattle

University of Washington School of Medicine, Seattle 5.—Established by the Legislature in 1945 and organized as one of the professional schools in the Division of Health Sciences of the University of Washington in 1946. The first class graduated in 1950. Coeducational. The minimum requirement for admission is three years of collegiate work. Tuition fees are $300 each year for residents of Washington and Alaska and $495 for nonresidents of these areas. Registration for 1949-1950 was 211; graduates 44. The first three classes were limited to 50 students but with the class entering in 1949 this number was raised to 75. The last session began Sept. 28, 1949 and ended June 10, 1950. The next session will begin Sept. 27, 1950 and will end June 9, 1951. The Dean is Edward L. Turner, M.D.

WISCONSIN

Madison

University of Wisconsin Medical School, 418 North Randall Avenue, Zone 6.—Organized 1907. Gave only the first two years of the medical course until 1925, when the clinical years were added. Coeducational since organization. The entrance requirement is three years of collegiate work. Fees for the first, second and third years $310, for the fourth year $220 per academic year for residents. An additional fee of $300 per year is charged nonresidents. Registration for 1949-1950 was 306; graduates 73. The last session for freshman, sophomore and junior students began Sept. 19, 1949 and ended June 16, 1950. The present senior class began June 27, 1949 and ended June 16, 1950. Freshman, sophomore and junior classes will begin Sept. 18, 1950 and will end June 15, 1951. The senior class began June 26, 1950 and will end June 15, 1951. The Dean is William S. Middleton, M.D.

Milwaukee

Marquette University School of Medicine, 561 North Fifteenth Street.—Organized in December 1912 by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. Coeducational since organization. Three years of collegiate work are required for admission. The fees are $650 per academic year. The registration for the 1949-1950 session was 364; graduates 84. The last session began Sept. 26, 1949 and ended May 3, 1950. The last senior class began July 5, 1949 and ended June 10, 1950. The next session for freshman, sophomore, and junior students will begin Sept. 25, 1950 and will end May 2, 1951. The present session for seniors began July 2, 1950 and will end June 9, 1951. The Dean is John S. Hirschboeck, M.D.

APPROVED MEDICAL SCHOOLS IN CANADA

CANADA

Alberta

University of Alberta Faculty of Medicine, Edmonton.—Organized in 1913. Coeducational since organization. Has given complete medical course since 1924. New course—three years premedical, four years of medicine—offered with the session 1947-1948. Tuition for the four years is $400 per session. The registration for 1949-1950 was 200; graduates, 41. The last session began Sept. 6th, 1949, and ended June 15, 1950. The next regular session will begin Sept. 5, 1950, and end June 15, 1951. The Dean is John W. Scott, M.D.

Manitoba

University of Manitoba Faculty of Medicine, Bannatyne Avenue, Winnipeg.—Organized in 1883 as Manitoba Medical College. First class graduated in 1886, and a class graduated each subsequent year. The college transferred all its property to the University of Manitoba in 1919 and assumed the present title. Coeducational since organization. Matriculation requirements include three years of collegiate work in the faculty of arts and sciences of a recognized university. The course extends over four years of eight months each and a hospital internship. The fees average $405.75 yearly. The registration for 1949-1950 was 294; graduates 63. The last session began Sept. 10, 1949 and ended May 15, 1950. The next session will begin on Sept. 11, 1950 and will end on May 5, 1951. The Dean is Lennox G. Bell, M.D.

Nova Scotia

Dalhousie University Faculty of Medicine, Morris Street, Halifax.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College, in 1885. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the university. First class graduated in 1872. Coeducational since 1871. Requires for matriculation two years of arts. The regular medical course covers four years and a hospital internship of one year approved by the medical faculty. The fees average $395.25 yearly; nonresidents $250.00 additional fee. The last session for freshmen, sophomores and juniors began Sept. 6, 1949 and for seniors May 9, 1949; all classes ended May 16, 1950. The registration for 1949-1950 was 226; graduates 43. The next session for all classes will begin Sept. 5, 1950 and will end May 15, 1951. The Dean is H. G. Grant, M.D.

Ontario

Queen's University Faculty of Medicine, Kingston.—Organized in 1852. First class graduated in 1855 and a class graduated each subsequent year. Fees for the first year amount to $342.50 and for each of the other five years $358.50. The course consists of six sessions of 30 teaching weeks, the sixth session being devoted entirely to clinical work in the hospitals affiliated with the University. This latter is not considered an internship. The degrees awarded are M.D., C.M. Freshmen will be admitted annually. Registration for 1949-1950 was 336; graduates 47. The last session began Sept. 19, 1949, and ended May 13, 1950. The next session will begin Sept. 18, 1950, and will end May 12, 1951. The last Convocation was held on June 3, 1950. The Dean is G. Harold Ettinger, M.D.

University of Western Ontario Faculty of Medicine, 346 South Street, London.—Organized in 1881 as the Western University Faculty of Medicine. First class graduated in 1883 and a class graduated each subsequent year. Present title in 1923. The Faculty of Medicine has been under the control of the Board of Governors of the University of Western Ontario since 1915. Coeducational since 1913. The normal course of study covers two honor college years of nine months each and four years of nine months each in the Faculty of Medicine. The total fees to residents of Canada for the last four years are $450 a year. The registration for 1949-1950 was 273; graduates 93. The last session began Sept. 12, 1949 and ended May 25, 1950. The next session begins Sept. 11, 1950 and ends May 24, 1951. The Dean is J. B. Collip, M.D.

University of Toronto Faculty of Medicine, Toronto 5.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it obsorbed Victoria University Medical Department and in 1903 it absorbed the Medical Faculty of Trinity University. Coeducational since 1903. The degree of M.D. is conferred after 4 years in the study of medicine. Admission to the medical course is gained following honour matriculation and after two years in the study of premedical requisites in the University of Toronto. A certain number are admitted each year to the first medical year who hold Arts degrees from recognized universities and who have covered the necessary work in the humanities and sciences. The B.Sc. (Med.) degree may be conferred for special work or investigation as a graduate degree, or under certain circumstances for an extra year's work as an undergraduate. The registration for 1949-1950 in the medical and premedical years was 964; graduates 161. The next session for first and second premedical years will begin on Sept. 20, 1950 and for first, second, third and fourth medical years on Sept. 18, 1950. The session for premedical years will end on April 28, 1951 and for medical years on May 12, 1951. Students will graduate annually in June. The Dean is J. A. MacFarlane, M.B.

Quebec

McGill University Faculty of Medicine, 3640 University Street, Montreal.—Founded in 1823 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-1839, owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop's College. Coeducational since 1917. Four years of collegiate work are required for admission. The total fees for each of the four medical years are $465. The registration for 1949-1950 was 453; graduates 113. The last session began Sept. 7, 1949 and ended June 3, 1950 for the first three classes and April 29 for the senior class. The next session will begin Sept. 6, 1950 and will end June 2, 1951 for the first three classes and April 27, 1951 for the seniors. The Dean is C. Lyman Duff, M.D.

University of Montreal Faculty of Medicine, 2900 Mount Royal Boulevard, Montreal.—Organized in 1843 as the Montreal School of Medicine and Surgery. In 1891, by Act of Parliament, the Medical Faculty of Laval University (organized in 1878) was absorbed. Present name by Act of Parliament in 1920. A class was graduated in 1843 and each subsequent year. Coeducational since 1925. The requirements for admission are: B.A. degree (or its equivalent), with a supplementary Premedical year in the Faculty of Pure Science (or an entrance examination on the Premedical subjects). An internship is required for graduation. The fees are $300.00 yearly for residents, and $360.00 yearly for nonresidents. The registration for 1949-1950 was 398; graduates 84. The last session began Sept. 15, 1949, and ended May 13, 1950. The next session will begin Sept. 18, 1950 and will end May 12, 1951. The Dean is Edmond Dubé, M.D.

Laval University Faculty of Medicine, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Laval University Faculty of Medicine; first class graduated in 1855, and a class graduated each subsequent year. The fees for each of the medical years average $300 for residents of Canada. Nonresidents are charged an extra fee of $200 each year. The premedical requirement is a B.A. degree or its equivalent. The registration for 1949-1950 was 599; graduates 116. The last session began Sept. 13, 1949 and ended June 1, 1950. The next session will begin Sept. 13, 1950 and will end June 1, 1951. The Dean is Charles Vézina, M.D.

APPROVED SCHOOLS OF THE BASIC MEDICAL SCIENCES IN THE UNITED STATES

MISSISSIPPI

University

University of Mississippi School of Medicine.—Organized in 1903. Coeducational since organization. A clinical department was established at Vicksburg in 1908 but was discontinued in 1910 after graduating one class. Entrance requirement is three years of collegiate work or ninety semester hours of credit. Fees average $410.50 annually. There is a nonresident fee of $200. The school operates on an accelerated program by accepting two freshman classes each session. The registration for 1949-1950 was 123. The last session began Sept. 6, 1949 and ended June 17, 1950. Additional freshman class was admitted February 20, 1950 and will complete year November 18, 1950. The sophomore session began July 5, 1949 and ended March 11, 1950. An additional sophomore session began November 14, 1949 and ended July 22, 1950. The next freshman class began July 31, 1950 and will end May 12, 1951. The next sophomore class began July 10, 1950 and will end March 17, 1951. The Dean is David Schultz Pankrats, M.D.

MISSOURI

Columbia

University of Missouri School of Medicine.—Organized at St. Louis in 1845; was discontinued in 1855 but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. Coeducational since 1872. The entrance requirement is three years of collegiate work. The B.S. degree in medicine is conferred at the end of the second year. Total fees for the first year are $236.50, for the second year $227.50. The registration for 1949-1950 was 90. The last session began Sept. 15, 1949 and ended June 9, 1950. The next session will begin Sept. 18, 1950 and will end June 8, 1951. The Dean is Trawick H. Stubbs, M.D.

NEW HAMPSHIRE

Hanover

Dartmouth Medical School.—Organized by Dr. Nathan Smith in 1797. The first class graduated in 1798. It is under the control of the Trustees of Dartmouth College. Courses of the third and fourth years were discontinued in 1914. Three years of college work and candidacy for the bachelor's degree are required for admission. Candidates for the A.B. degree in Dartmouth College may substitute the work or the first year in medicine for that of the senior year. The tuition is $675 for each year. The registration for 1949-1950 was 48. The last session began on Sept. 18, 1949 and ended June 11, 1950. The next session will begin Sept. 24, 1950 and will end June 17, 1951. The Dean is Rolf C. Syvertsen, M.D.

NORTH CAROLINA

Chapel Hill

University of North Carolina School of Medicine.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department in Raleigh. The first class was graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. Coeducational since 1914. Three years of college work are normally required for admission. Certificates are awarded on the completion of two years' work in medicine. The fees are $450 per year for residents; for nonresidents an additional fee of $300 per year. The registration for 1949-1950 was 119. The North Carolina Legislature of 1947 appropriated funds for the expansion of the school to the full four years. The full program will probably not get under way for two to three years. The last session began Sept. 19, 1949, and ended June 3, 1950. The next session will begin Sept. 18, 1950, and end June 4, 1951. The Dean is W. Reece Berryhill, M.D.

NORTH DAKOTA

Grand Forks

University of North Dakota School of Medicine.—Organized in 1905. Offers only the first two years of the medical course. Coeducational since organization. Three years work in a college of liberal arts are required for admission. The B.S. degree in combined arts-medical course is conferred at the end of the second year. The fees are $150.00 each year for resident students and $213.50 for nonresidents. The registration, academic year 1949-1950 was 60. The last session began Sept. 19, 1949 and ended June 2, 1950. The next session will begin Sept. 18, 1950 and will end June 4, 1951. The Dean is W. F. Potter, M.D.

SOUTH DAKOTA

Vermillion

University of South Dakota School of Medical Sciences.—Organized in 1907 as the University of South Dakota School of Medicine. Present title in 1937. Coeducational since organization. Offers only the first two years of the medical course. Three years work in a college of liberal arts are required for admission. Students who complete the third year of premedical work in the College of Arts and Sciences at the University of South Dakota may apply the work of the first year of medicine to an A.B. degree.: The B.S. degree is conferred at the end of the second year on those students who do not hold a combination (Arts and Sciences and Medicine Course) A.B. degree. The tuition is $303 for the first year residents and $318 for second year residents; $513 for first year nonresidents, and $528 for second year nonresidents. Registration for 1949-1950 was 59. The last session began Sept. 5, 1949 and ended May 29, 1950. The next session for first and second year students will commence Sept. 4, 1950 and will end June 22, 1951 for first year students and will end July 28, 1951 for second year students. (There is a twenty-four day break between the end of the didactic year for second year students and the four weeks of clerkship.) The Dean is Donald Slaughter, M.D.

WEST VIRGINIA

Morgantown

West Virginia University School of Medicine.—Organized in 1912. Gives the first two years of the medical course, but agreement has been made for the transfer of 20 students each year to the Medical College of Virginia. Coeducational since organization. Entrance requirements are three years of collegiate work. The B.S. degree is conferred at the end of the second year. Fees for residents of the state are, respectively, $258 and $268; nonresidents, $150 additional each year. The registration for 1949-1950 was 60. The last session began Sept. 19, 1949 and ended June 5, 1950. The next session will begin Sept. 18, 1950 and will end June 4, 1951. The Dean is Edward J. Van Liere, M.D.

APPROVED SCHOOL OF THE BASIC MEDICAL SCIENCES IN CANADA

Saskatchewan

University of Saskatchewan School of Medical Sciences, Saskatoon.—Organized in 1926. Coeducational. Offers the first two years of the medical course. Two years of university premedical work is required for admission. The B.A. degree is conferred at the end of the second year. The fees are $380. The registration for 1949-1950 was 61. The last session for freshmen began Sept. 20, 1949 and ended June 20, 1950. The next session will begin Sept. 19, 1950 and will end June 19, 1951. The Dean is W. S. Lindsay, M.B.

APPROVED EXAMINING BOARDS IN MEDICAL SPECIALTIES

The chief functions of the American boards in the specialties are (*a*) to conduct investigations and examinations to determine the competence of voluntary candidates for certificates issued by the respective boards, (*b*) to grant and issue certificates of qualification to candidates successful in demonstrating their proficiency, (*c*) to stimulate the development of adequate training facilities, (*d*) to aid in evaluating residencies and fellowships under consideration for approval by the Council on Medical Education and Hospitals of the American Medical Association and (*e*) to advise physicians desiring certification as to the course of study and training to be pursued.

The boards are in no sense educational institutions, and the certificate of a board is not to be considered a degree. It does not confer on any person legal qualifications, privileges or the license to practice medicine or a specialty. The boards do not purport in any way to interfere with or limit the professional activities of any licensed physician, nor do they desire to interfere with any practitioners of medicine in any of their regular or legitimate duties. This philosophy has, perhaps, been most fully expressed by the American Board of Surgery in the following statement:

> The American Board of Surgery has never been concerned with measures that might gain special privileges or recognition for its certificants in the practice of surgery. It is neither the intent nor has it been the purpose of the board to define requirements for memberships on the staffs of hospitals. The prime object of the board is to pass judgment on the education and training of broadly competent and responsible surgeons—not who shall or shall not perform surgical operations. The board specifically disclaims interest in or recognition of differential emoluments that may be based on certification.

Nineteen boards in the specialties have been organized and are approved by the Council of Medical Education and Hospitals of the American Medical Association on the basis of minimal standards governing specialty boards promulgated by the Council. No new board was formed in 1950.

Two boards certify candidates in subspecialties. The American Board of Internal Medicine certifies in allergy, cardiovascular disease, gastroenterology and pulmonary diseases. The American Board of Pediatrics certifies in allergy. Until the formation of an independent board in proctology in 1949, the American Board of Surgery certified candidates in this field as a subspecialty. Regular board certification is a prerequisite for certification in the subspecialties. The certifying of specialists in subspecialties by these boards is also approved by the Council.

Four boards confer certificates in special divisions of their specialty. The American Board of Otolaryngology grants a limited certificate in endoscopy. The American Board of Pathology issues certificates in pathologic anatomy, clinical pathology, a combination of these two fields and in clinical bacteriology. The American Board of Psychiatry and Neurology confers separate certificates in psychiatry and in neurology or a combined certificate for those qualified in both fields. The American Board of Radiology issues certificates in radiology, roentgenology, diagnostic roentgenology, therapeutic radiology and radium therapy.

TABLE 29.—*Approved Examining Boards in Medical Specialties*

Key No.	Name of Board	Year of Activation	Total Certificates Awarded to July 1, 1949	Total Certificates Awarded to June 30, 1950
1	American Board of Pediatrics	1933	3,007	3,305
2	American Board of Psychiatry and Neurology	1934	3,242	3,628
3	American Board of Orthopedic Surgery	1934	1,352	1,557
4	American Board of Dermatology and Syphilology	1932	1,119	1,266
5	American Board of Radiology	1934	3,027	3,369
6	American Board of Urology	1935	1,345	1,446
7	American Board of Obstetrics and Gynecology	1930	2,075	2,136
8	American Board of Internal Medicine	1936	5,844	6,316
9	American Board of Pathology	1936	1,649	1,799
10	American Board of Ophthalmology	1917	2,800	3,042
11	American Board of Otolaryngology	1924	4,262	4,454
12	American Board of Surgery	1937	3,830	4,317
13	American Board of Anesthesiology	1937	524	683
14	American Board of Plastic Surgery	1937	200	214
15	American Board of Neurological Surgery	1940	303	328
16	American Board of Physical Medicine and Rehabilitation	1947	140	140
17	American Board of Preventive Medicine and Public Health	1948	277	780
18	American Board of Proctology	1949	...	44
19	Board of Thoracic Surgery (An Affiliate of the American Board of Surgery)	1948	174*	236*
	Totals		35,895	39,804
	Certification in Subspecialties			
	American Board of Internal Medicine			
	Allergy		124	129
	Cardiovascular Disease		430	447
	Gastroenterology		230	249
	Pulmonary Disease		185	194
	American Board of Pediatrics			
	Allergy		42	42
	American Board of Surgery			
	Proctology		81	81†
	Totals		1,082	1,142
	Special Certification			
	American Board of Otolaryngology			
	Endoscopy		2	3
	American Board of Pathology			
	Pathologic Anatomy		‡	25
	Clinical Pathology		..	100
	Pathologic Anatomy and Clinical Pathology		..	24
	Clinical Bacteriology		..	1
	American Board of Psychiatry and Neurology			
	Psychiatry		2,143	2,480
	Neurology		209	244
	Psychiatry and Neurology		890	904
	American Board of Radiology			
	Radiology		287§	551
	Roentgenology		56§	101
	Diagnostic Roentgenology		58§	80
	Therapeutic Radiology		4§	14
	Radium Therapy		...	1
	Totals		3,649	4,528

* Included in totals for American Board of Surgery.
† Independent board established in 1949.
‡ Figures not available.
§ Figures refer to certificates issued July 1, 1948 to June 30, 1949. Previous figures not available.

Each of the American Boards has published a booklet containing a list of its officers and a brief statement of its organization, purposes and the qualifications that determine eligibility for certification. The current data pertaining to each board and the names of the officers of each board are reproduced in the following pages.

The accompanying table lists the approved specialty boards, the year of activation, the number of certificates awarded to July 1, 1949 and the number of physicians certified in the ensuing year ending July 1, 1950. Figures are also given in these two groups showing the numbers certified in the subspecialties and finally the available figures pertaining to special certification by the boards of otolaryngology, pathology, psychiatry and neurology, and radiology.

On July 1, 1949 there were 35,895 physicians certified by the 18 boards in operation at that time. During the year July 1, 1949 to June 30, 1950, there were 3,909 certificates issued by the 19 boards in operation during this period. Up to this latter date a total of 39,804 physicians have been certified.

The first examination for certification in thoracic surgery was given on Aug. 1, 1949. The figure 174 represents certificates issued to the Founders Group. The first examination of the American Board of Proctology was given in November 1949.

TABLE 30.—*Annual Specialty Board Certification, 1940-1950*

Year (Ended March)	Number of Boards in Existence	Number Certified	Accumulated Totals
1940	14	.....	15,853
1941	15	2,085	17,938
1942	15	1,756	19,694
1943	15	2,172	21,866
1944	15	1,578	23,444
1945	15	1,308	24,752
1946	15	1,320	26,072
1947	15	2,424	28,496
1948	16	3,002	31,416
1949 (July 1)	19*	4,479	35,895
1950 (July 1)	19	3,971	39,866

* One board, the American Board of Proctology, did not certify any candidates during this period.

On July 1, 1949, 1,082 certificates in subspecialties had been awarded. An additional 60 were awarded during the next 12 months, bringing the total certificates issued in the subspecialties to 1,142 on July 1, 1950.

Since July 1, 1949, 4,528 special certificates have been issued by the boards in otolaryngology, pathology, psychiatry and neurology, and radiology.

Table 30 records the number of specialists certified each year during the past 11 years by all boards and the accumulative totals. In this period 39,866 certificates were issued. The largest number of physicians, 4,479, obtained certificates in the period from March 1, 1948 to June 30, 1949. The number certified in that period was 508 greater than in the current year.

The current list of residencies and fellowships in the specialties approved by the Council and acceptable to the American Boards in fulfilment of their clinical training requirements was published in the April 15, 1950 issue of THE JOURNAL.[1] Additions to this list appear on page 135 of this issue.

1. J. A. M. A. **142**:15 (April 15) 1950.

AMERICAN BOARD OF ANESTHESIOLOGY

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CERTIFICATION

1. *Method of Making Application.*—Application for certification may be made after a physician has completed one year of approved training. Application must be made to the secretary on a form prescribed by the board, procured only on written request of the applicant, and must be filed at least six months prior to the date of examination.

The secretary cannot make any eligibility rulings. These are made only by the entire board on recommendation of the appropriate committees after reviewing the candidate's formal application.

2. *Requirements.*

A. Each applicant before he shall become eligible for certification in anesthesiology, must:

1. Have graduated from a medical school recognized by the Council on Medical Education and Hospitals of the American Medical Association, and have completed an internship of not less than one year in a hospital approved by the same Council, or its equivalent; and

2. Establish in a manner satisfactory to the board:

(*a*) He is a physician duly licensed by law to practice medicine, and

(*b*) He is of high ethical and professional standing, and

(*c*) He has received adequate special training in anesthesiology, and

3. Submit proof to the board that he has limited his practice to anesthesiology as a specialty for five calendar years of which at least two have been in formal training approved by the board, and that he intends to continue to limit his practice to anesthesiology; and

4. Be a member in good standing in the American Medical Association, the state and local county medical society or comparable national medical society approved by this board. He must be a member in good standing of the American Society of Anesthesiologists, Inc.

5. Prove to the satisfaction of the board by such written, survey, oral and practical examinations as the board may prescribe that he is qualified to practice anesthesiology; and

6. Personally prepare such case history abstracts of personally conducted procedures pertaining to anesthesiology as the board may specify.

B. Each applicant shall be classified for the purpose of examination and shall be examined in such a manner and under such rules as the board may prescribe.

3. *Conduct of Examinations.*

A. Written Examination: Eligible applicants may take this examination on completion of two years of training approved by the board. Written examinations are held annually in

approximately twelve locations throughout the United States on the third Friday in July. Written examinations are of the multiple choice type covering the following subjects: anatomy, chemistry and physics, pharmacology, pathology and physiology. Examinations are conducted on the "honor system." Candidates are assigned an identification number for use on examination papers, grading is accomplished by calculating machines and grades are reported to the secretary's office by identification number only. A passing grade is required.

B. Survey Examination: Started in 1949 this examination is conducted by a diplomate of the board who visits the applicant in his own locality to observe him in the practice of anesthesiology. This examination is conducted on completion of four years limited to anesthesiology (including two years of approved training).

C. Oral Examination: On completion of a favorable survey examination and five years limitation of practice to anesthesiology an applicant is eligible to appear for oral examination. Examinations are conducted semi-annually, in April and October. Examiners consist of directors of the board plus diplomates who assist as associate examiners. Oral examinations cover all phases of anesthesiology as do the written examinations; emphasis, however, is placed on clinical application.

D. Practical Examination: At the discretion of the board practical demonstrations may be required of the management of the candidate's clinical practice in his local surroundings. This may include inspection of clinical records, reports of departmental activities, library facilities, available apparatus and demonstrations of application of anesthetic agents, methods and all technics included in anesthesiology.

A candidate who fails in the written, survey, oral or practical examination may be permitted reexamination at yearly intervals for two consecutive examinations in that part. A fee of $15.00 will be charged for each reexamination for candidates who filed application January 1, 1950 or later. The board may, however, for sufficient reason deny a candidate the privilege of reexamination. Applicants who fail to exercise the privilege of reexamination within three years of the date of becoming eligible for examination are required to file a new application and pay a new application fee. The board reserves the right to limit the number of candidates to be admitted to any examination.

Applications must be on file at least six months prior to the date of examination.

FEE

The fee shall be $125. At least $50 shall be paid on filing the application, of which sum $35 shall be returned if the candidate is not accepted for examination. The remainder ($75) shall be paid before taking the examination. Applications filed after Jan. 1, 1950 must be accompanied by an application fee of $125.

The board is a nonprofit organization. The fees for examination and certification have been computed on a basis of cost of maintaining an administrative office and conducting examinations. The board reserves the right to increase the fee when necessary.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY

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NELSON P. ANDERSON, Los Angeles.
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FRANCIS E. SENEAR, Chicago.
GEORGE M. LEWIS, Secretary-Treasurer, 66 East 66th Street, New York 21.

REQUIREMENTS FOR ELIGIBILITY FOR EXAMINATION

I. GENERAL REQUIREMENTS

1. High ethical and professional standing.

2. Graduation from a medical school recognized by the Council on Medical Education and Hospitals of the American Medical Association. The credentials of graduates of foreign schools must be approved by the National Board of Medical Examiners.

3. Satisfactory completion of an internship of not less than one year in a hospital approved by the same Council. During three years of the second World War, internships of nine months only were the rule. These were voted to fulfill the internship requirement. However, all internships completed on July 1, 1947 or thereafter must be of twelve months duration or longer.

4. A state license to practice medicine issued by endorsement of the certificate of the National Board of Medical Examiners or following examination.

5. Membership in the American Medical Association or membership in a similar society recognized as having the same purpose as the American Medical Association.

6. Citizenship in the United States or citizenship—meaning native citizens—in Canada or Cuba.

II. SPECIAL REQUIREMENTS

A period of study, after the internship, of not less than three years. Up to one month in each of the three years may be spent as a vacation but the exact time is a matter for the chief of service to decide. Vacations may not be postponed from one year to another. Candidates will not be eligible for examination until three full years have elapsed since the beginning of training. This training may be obtained as resident, fellow or graduate student in clinics, dispensaries, hospitals or laboratories recognized by the Council on Medical Education and Hospitals of the American Medical Association and approved by the American Board of Dermatology and Syphilology as competent to provide a satisfactory training in dermatology and syphilology. This period of specialized training shall include:

(*a*) At least one calendar year in an institution approved for three year training (less one month for vacation).

(*b*) Graduate training in the basic medical sciences which are necessary for the proper understanding and treatment of the diseases involved in this specialty.

Instruction in the following fundamental subjects as related to the skin is deemed advisable by the board: embryology, histology, chemistry, physiology, bacteriology, mycology, parasitology, pathology, immunology, serology, pharmacology and materia medica, and physics of physical therapy.

(*c*) Carefully supervised clinical and laboratory experience in the specialty.

(d) Annual examinations in the clinical, laboratory and public health aspects of dermatology and syphilology.

PRECEPTORSHIP TRAINING

Candidates may spend up to two years of their training under the direction of a diplomate of the board, who has also been approved as a preceptor by the board. Not more than one half of each training day may be spent in the office of the preceptor while during the other half day, supervised work should be performed in an approved institution. The program which the student follows must conform to a schedule which an approved preceptor files with the board. The preceptor and the chief of service of the institution which the candidate attends are jointly responsible for the training received by the student. Preceptorship training may be taken during any two of the years of training. Time spent with an instructor who has not been approved by the board may count only as experience and not as training. A list of approved preceptors is available in the office of the secretary.

The board assumes the responsibility of determining the standards of knowledge to be acquired, but on the candidate rests the responsibility of acquiring the knowledge to fill these standards.

PRELIMINARY REGISTRATION

All students beginning their graduate training should file a preliminary registration form with the secretary. A standard form will be sent on request. No fee is required. Any deficiencies in credentials would be detected early in the training period and any mistakes in the program could be corrected.

REGISTRATION FOR EXAMINATION

In order that the committee on requirements may appraise carefully the qualifications of candidates, application must be made on a special blank, which may be obtained from the secretary. No application will be considered unless made on the regular application blank. Applications should be filed early in order to obtain full advantage of the sets of histopathologic slides which are available through the Army Medical Museum in Washington. The completed application blank should be sent, several months before the date of examination, to the secretary of the board together with the required reprints, photographs and a registration fee of $25, which will not be refunded under any circumstances. No application will be considered until this fee is received. An examination fee of $75 is payable when the candidate is notified that his application is acceptable to the board. The fee of $100 has been carefully computed and is used entirely for administrative purposes. Examiners for the board do not receive any compensation except for actual expenses connected with holding the examinations.

Make checks payable to American Board of Dermatology and Syphilology, Inc.

EXAMINATIONS

All applicants classified are required to take and pass a written examination before they are eligible for the oral test. The written examination on clinical, basic science and laboratory subjects will be held simultaneously at stated intervals in different parts of the country, approximately two months before the oral examination.

All applicants are also required to pass an oral, clinical and laboratory examination. This examination will be conducted in a clinic or hospital ward where individual cases will be discussed with each candidate, as well as various subjects related to the skin such as histopathology, mycology, allergy and physics of physical therapy. The board reserves the right to add to this list other subjects within the field of dermatology and syphilology.

A candidate for a certificate may take his examination the next time it is given after he has completed three full years of training in the specialty, provided he makes application before the quota for that session is filled; this provision does not affect the regulations about the issuance of the certificate. (See Certificates.)

Examinations are designed to test the candidate's fitness to practice dermatology and syphilology as a specialty. The board will try especially to ascertain the breadth of his knowledge in the basic, as well as the clinical aspects of cutaneous medicine, to test his familiarity with the recent literature of dermatology and syphilology and to ascertain his general qualifications as a specialist in this branch of medicine.

Whenever an applicant fails to pass the examination, the board, if requested, will make suggestions regarding further training for the purpose of overcoming deficiencies in the applicant's knowedge of this specialty.

Candidates who have signified their intention of taking the examination and who fail to appear at the scheduled time or who attempt to cancel their appointment after the sending of the final notice, shall forfeit the fee for the examination.

Except in special circumstances, applicants shall take the examination within the year following the filing of application and the deposit of the fee.

The oral examination has been held twice during each of the last three years. If sufficient candidates qualify, this policy will be continued.

REEXAMINATIONS

If the candidate fails or is conditioned in an examination he will be automatically admitted to a second examination and must give at least sixty days' written notice of his intention to appear for reexamination. His acceptance for a particular examination is dependent on the number of candidates already on the roster. If a candidate who has failed or has been conditioned does not appear for reexamination before the expiration of three years, he will be required to make a new application and pay an additional fee of $75 before reexamination.

A candidate who has failed twice must file a new application and pay an additional fee of $75.

CERTIFICATES

A certificate will not be issued until the successful candidate has completed at least five years of dermatologic training and experience. The granting of this certificate by the board indicates that the holder of the certificate has had adequate training in dermatology and syphilology and has successfully fulfilled the requirements of the board.

A certificate granted by this board does not of itself confer or purport to confer any degree or legal qualifications, privileges or license to practice dermatology or syphilology. The board does not intend to limit or interfere with the professional activity of any duly licensed physician. Its aim is to improve the standards of practice of dermatology and syphilology by encouraging improvement in the opportunities for and quality of training for specialists in this field of medicine, and to certify as specialists those who voluntarily comply with the requirements of the board.

Certificates will be issued only to physicians in the United States and its possessions, in Canada and in Cuba.

AMERICAN BOARD OF INTERNAL MEDICINE

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RESPONSIBILITIES

The major object of the board is to pass judgment on the competence of internists—not to determine who shall or shall not practice internal medicine as a specialty.

The American Board of Internal Medicine is not concerned with any mechanism which gains special privileges or specific recognition for those physicians who have been certified in

internal medicine. It has never been the intent of the board to define requirements for membership on the staffs of hospitals.

The board endorses completely the stand of the American Board of Surgery which "specifically disclaims interest in or recognition of differential emoluments that may be based on certification."

REQUIREMENTS FOR ADMISSION TO EXAMINATION AND CERTIFICATION

Each applicant for certification by this board must satisfy the qualifications listed below: (I) General Qualifications A, B, C, D; (II) Professional Qualifications A, B, C, D. For exceptions to the requirements C and D under Professional Qualifications see paragraph G.

I. General Qualifications

A. All candidates must be citizens of the United States or Canada.

B. All candidates must present evidence of satisfactory moral and ethical standing in the medical profession.

C. All candidates must be active members in good standing in their county and state medical societies in their state of legal residence. Under unusual and exceptional circumstances the board reserves the privilege of modifying this requirement. (This ruling shall not apply to commissioned officers of the United States regular Army or Navy or United States Public Health Service or to full time staff members (physicians) of the Veterans Administration who are otherwise Service Fellows of the American Medical Association.)

D. Canadian citizens must be active members of the Canadian Medical Association before admission to examination.

II. Professional Qualifications

A. Graduation from a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association at the date of graduation.

B. Satisfactory completion of an approved internship of not less than twelve months.[1]

C. Residency or fellowship approved by the Council on Medical Education and Hospitals of the American Medical Association in internal medicine according to the following plan (Plan A) or one of the alternate plans described under paragraph D.

Plan A: A residency or fellowship in internal medicine for a period of not less than three years in a hospital or other institution approved by the Council on Medical Education and Hospitals of the American Medical Association for residency or fellowship in internal medicine. In such instances in which a resident's nominal status differs from that of the other hospital residents, he must furnish the board with certification by the chief of the medical service and the medical director of the hospital that he actually performed the full duties of a resident as a bona fide member of the residency program. In addition, two years of practice of clinical internal medicine will be required. The board will accept the following equivalents as satisfying one year only of the three years of residency or fellowship to which this paragraph refers. (Two years must be in the field of general internal medicine.)

1. If twelve months of a two year approved internship in a hospital approved for residency training in internal medicine is limited to the medical service and medical specialties, credit will be granted for a first year of assistant residency. The remaining two years of residency training must be in the general field of internal medicine. Certification by the chief of the medical service as to compliance with this requirement must accompany application.

2. One year of approved residency in one of the medical specialties: allergy, cardiovascular disease, gastroenterology, hematology, pulmonary diseases, neurology, pediatrics, psychiatry, dermatology and syphilology.

3. One year of approved residency in pathology.

4. One year as a graduate student or as an instructor in an approved medical school on a full time basis in bacteriology, biochemistry, pathology, pharmacology, physiology or internal medicine.

5. An advanced degree in the fundamental sciences.

NOTE.—Graduate training credit for the time involved will be allowed candidates who take and satisfactorily complete postgraduate courses in internal medicine or the basic medical sciences provided by accredited medical schools on a full time basis. This ruling shall not apply to courses of less than three months' or more than twelve months' duration. A certificate of creditable performance, based in part, at least, on a formal examination on completion of the course, will be required.

NOTE.—Fellowship or research assignments not approved by the Council on Medical Education and Hospitals will require certification by the chief of service that such assignment was equivalent in graduate training opportunities and patient responsibilities to that of an approved residency in internal medicine or the subspecialties recognized by the board. This certification must be presented before application is filed.

D. Alternate Training Plans: The board firmly believes that the plan of intensive training prescribed above offers the best opportunity for a young physician to prepare himself to meet his responsibilities as a specialist in internal medicine. It is recognized, however, that capable individuals may accomplish the same result in a longer period of time during which the training is less intensive. The board realizes that a number of medical graduates cannot follow the shorter and more desirable plan either because suitable residencies are not available or, in some instances, because of personal and economic reasons. Accordingly the board has modified its previous regulations governing eligibility for admission to examination. In doing so the board has not modified its standards of examination. It has liberalized its eligibility requirements for admission to examination by accepting half time formal training and the practice of internal medicine under favorable circumstances as to professional and hospital contacts, in lieu of part of the full time requirements. It is hoped that by this means exceptional individuals may acquire a knowledge of medicine and experience in its application sufficient to qualify for examination.

The program previously described (Plan A), which consists of three years of formal training in an approved residency or its equivalent, following internship, and two additional years in the practice of internal medicine, is recommended by the board. Variations in this program are now subject to the following regulations.

1. In all instances, one year of approved internship and one year of approved residency will be required, except as indicated under Plan G. The graduate training credit of one year heretofore granted as a result of active duty as a commissioned officer in the armed forces during the period beginning Dec. 7, 1941 and ending Jan. 1, 1947 may not be applied in satisfaction of the one year of approved residency referred to in Plan D, E or F unless the candidate's assignment is considered by the board to have been equivalent to an approved residency.

2. Following one year of internship and two years of approved residency,[2] the remaining requirements may be satisfied by:

Plan B; that is, by two years of half time formal training followed by two years of practice limited to internal medicine, or by

Plan C; that is, by five years of practice limited to internal medicine.

3. Following one year internship and one year of approved residency, the remaining requirements may be satisfied by:

Plan D[3]; that is, by four years of half time formal training followed by two years of practice limited to internal medicine; or by:

1. During the period in which the 9-9-9 program was in effect an approved internship of nine months will satisfy the requirement of twelve months. A residency of nine months is considered as nine months only.

2. For the second year of approved residency one of the equivalents described under C-Professional Qualifications may be substituted.

3. Half time formal training is regarded as four hours per day for six days per week. It is required that half time formal training be verified by the head of the department. Verification must accompany application.

Plan E[3]; that is, by two years of half time formal training followed by five years of practice limited to internal medicine, or by:

Plan F; that is, by eight years of practice limited to internal medicine.

4. In every instance at least two years of practice in internal medicine must be included, but in instances in which four years of practice are substituted for one year of residency, only one additional year of practice will be required; when more than eight years of practice are substituted for two years of residency an additional year of practice will not be required.

5. Physicians who have practiced internal medicine for twelve years following an approved internship may qualify for the examinations without further training (Plan G).

Half time formal training under expanded plans B, D and E is defined as follows:

1. Half-time[3] as an instructor in clinical medicine in a recoginzed medical school in the United States or Canada.
2. Half-time[3] in a research fellowship sponsored by a recognized medical school in the United States or Canada.
3. Half-time[3] as a graduate student in an approved graduate medical school in the United States or Canada.

E. Practice Requirements: A period of not less than two years of practice in the general field of clinical internal medicine or in the more specialized branches of medicine. (See exceptions, Section D, paragraph 4.) This requirement may be satisfied by independent practice or in association with a recognized internist.

NOTE.—Although in general the board believes it desirable to complete the three years of formal training before satisfying the requirements of practice, a reversal of this order is acceptable.

F. Graduates of Foreign Schools: At the present time neither the Council on Medical Education and Hospitals of the American Medical Association nor any other educational agency in the United States has the facilities to evaluate adequately the quality of foreign medical education. This board must, therefore, evaluate the fundamental educational credentials and other qualifications of each individual candidate educated abroad who applies for admission to examination. (Requirements for graduates of foreign schools may be obtained on request to the board—One West Main Street, Madison 3, Wis.)

G. Candidates Graduating Prior to 1937: The requirement of three years of graduate training will not apply to candidates graduating from approved medical schools in the United States and Canada in 1936 or previous thereto, provided such candidates have limited their work to the field of internal medicine for at least two years, and provided each candidate is recognized as an internist by his colleagues in his community.

H. "Preceptor Training": Preceptor type training is not recognized in satisfaction of any part of the three year requirement of formal graduate training.

I. The board will grant one year of graduate training credit, or one year in satisfaction of the requirements of practice, regardless of assignment, for active duty as a commissioned officer in the United States Army, Navy or United States Public Health Service for one year or more, beginning on or subsequent to Dec. 7, 1941 and terminating on or before Jan. 1, 1947. Commissioned officers serving less than one year prior to Jan. 1, 1947 may apply that interval as graduate training, or in partial satisfaction of the requirements of practice.

Service credit, either graduate training or practice, beyond one year requires individual evaluation by the Credentials Committee. If a candidate believes that his service prior to Jan. 1, 1947 merits more than one year of graduate training credit or practice credit he should request Form S-11. This application requires the full name and present addresses of former chiefs of service.

PRINCIPLES OF TRAINING

The American Board of Internal Medicine is interested in the fact that the candidate has embarked on a career of study voluntarily and has thereby expressed the desire to excel and to participate personally in the world's progress in medicine.

Preparation must be based on years of continuous thoughtful study. Therefore, in suggesting a program for those who wish advice, the board hopes to assist the candidates to avoid inferior and superficial programs which may lead to failure and disappointment in later years.

The board believes that all internists should have a sound fundamental knowledge of anatomy, bacteriology, biochemistry, pathology, pharmacology and physiology. Such knowledge is essential to the continued progress of any internist. The board anticipates that adequate training will be obtained in the basic sciences as applied to internal medicine during a formal three year residency program.

The board wishes to emphasize that time and training are but a means to the end of acquiring a broad knowledge of internal medicine which the candidate must demonstrate to the board in order to justify it in certifying that he is competent to practice internal medicine as a specialty. The responsibility of acquiring the knowledge rests with the candidate. The responsibility of maintaining the standards of knowledge required for certification rests with the board.

APPLICATION

Candidates for examination must make their application on a prescribed form, which may be obtained from the office of the Executive Secretary-Treasurer.

The application must contain a record of the candidate's premedical and medical training as well as of internships, residencies, graduate study, hospital or dispensary staff appointments, teaching positions, service in the armed forces, membership in medical societies, medical papers published and the names of four well known internists to whom the board may write for professional and character reference.

The application must be accompanied by one recent, signed photograph of the candidate mounted on the application, and the registration and examination fee of $40, which fee will cover both the written and oral examinations. An additional fee of $10 will be required when the certificate is issued.

The requirements of graduate training and two years of practice in the field of internal medicine must be satisfactory before a candidate is eligible to apply for admission.

METHOD OF EXAMINATION—WRITTEN AND ORAL

The examinations for certification by the board comprise two parts: Part I is written; Part II is clinical and is an oral examination. The written examination is held simultaneously in different sections of the United States and Canada. Effective Jan. 1, 1949, one written examination will be given each year. This examination will be held on the third Monday in October. This examination is divided into a morning and afternoon period for each of which three hours are allowed. The questions are of the multiple choice type, framed in such a manner as the board elects and designed to test the applicant's knowledge of applied physiology, anatomy, physiological chemistry, pathology, bacteriology and pharmacology as related to internal medicine, and his basic clinial acumen.

Candidates must pass the written examination before admission to the oral examination will be authorized. The oral examination is conducted under the direct supervision of the board. It is held near the time and place of the annual meetings of the American Medical Association and the American College of Physicians. The examination is conducted at the bedside of the patient. Each candidate is assigned two or more patients and is expected to be sufficiently familiar with whatever problems present themselves to satisfy the board of his clinical expertness.

Normally only two oral examinations are given each year. The board may, however, schedule special oral examinations if necessary. Announcement of all examinations will appear in the *Annals of Internal Medicine* and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. Applications cannot be accepted until the schedule is announced in the publication referred to, and cannot be accepted after the closing date as announced.

REEXAMINATION—WRITTEN AND ORAL

1. Effective July 1, 1949, the board will waive restrictions on the number of written examinations authorized, provided the candidate has satisfied the requirements hereinafter set forth in

paragraph 4. The board may at its discretion deny reexamination in individual cases. The interval between the first and second written examinations will be one year. The interval between all subsequent written examinations will be two years. A longer period may be required by the board. A fee of $10 is required for each additional written examination.

2. Effective July 1, 1949, the board will waive restrictions on the number of oral examinations authorized, provided the candidate has satisfied the requirements hereinafter set forth in paragraph 4. The board may at its discretion deny reexamination in individual cases. The interval between the first and second oral examinations will be one year. The interval between the second and third oral examinations will be not less than two years. The interval between all subsequent oral examinations will not be less than three years. A longer period may be required by the board. A fee of $20 is required for each additional oral examination.

3. This ruling does not make it mandatory for a candidate to repeat the examination within the specified time limit. Candidates may elect a longer interval in the case of both the written and oral examinations.

4. When applying for reexamination, a candidate who has been unsuccessful in three written or three oral examinations, will be required to present evidence that he has completed additional graduate training of at least three months in internal medicine in an approved medical school, on a full time basis, or its equivalent in approved resident or fellowship training since the last examination. In individual cases the board may require a longer course. Short courses of less than three months may not be applied in satisfaction of this requirement. A new application for admission is required.

The provisions of this section shall be effective rectroactively. Any candidate previously disqualified from further examination on the basis of having been unsuccessful in three examinations, either written or oral, may now apply for reexamination subject to the provisions of paragraphs 1 through 4 of this section.

CANCELLATIONS

Effective July 1, 1949, any candidate who cancels his assignment for a written or an oral examination after the official cards of admission have been mailed, will be required to pay a special fee in the amount of $10 before a subsequent examination, unless his cancellation was due to a cause deemed adequate by the board to exempt him from such special fee. The mailing date of the cards of admission will be approximately one month previous to the date of examination. This provision becomes necessary because of the large number of cancellations after complete arrangements have been made, and the expense incident thereto.

CERTIFICATES

The certificate issued by the American Board of Internal Medicine shall be in such form as to comply with the articles of incorporation and the by-laws and shall be signed by the officers and members of the board and shall bear the official seal of the board.

Certificates of the board will be issued to candidates who have satisfactorily completed the written and oral examinations and have been found qualified by the board to practice the specialty of internal medicine. Specialty certification will be designated on the certificate, for those so certified.

SUBSPECIALTY BOARDS

Allergy, cardiovascular disease, gastro-enterology and pulmonary diseases are recognized specialties.

Each subspecialty application is individually considered and acted on by the subspecialty board concerned. The candidate is not eligible for examination until his application has been approved by the subspecialty board concerned and confirmed by this board.

All candidates must pass the written and oral examinations in internal medicine before admission to examination in a specialty of medicine referred to. The specialty examinations are oral only and may be taken at any regularly scheduled oral examination subsequent to the candidate's certification in general medicine. Announcements of the oral examination will appear in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and the *Annals of Internal Medicine*.

Application forms will be forwarded on request to the office of the Executive Secretary-Treasurer and should be returned to his office when completed.

INFORMATION ON CERTIFICATION IN ALLERGY BY THE AMERICAN BOARD OF INTERNAL MEDICINE

1. Two years, full time, in an approved allergy clinic and hospital (including training both in Allergy and Internal Medicine or Pediatrics), or

2. One year, full time, in an approved allergy clinic and hospital and two additional years of attendance at an allergy clinic and its activities, or

3. Five years, full attendance at an approved allergy clinic and its activities.

Approval is granted solely by the Council on Medical Education and Hospitals of the American Medical Association.

The Director or Chief of the Allergy Clinic must be certified in Allergy by the American Board of Internal Medicine or the American Board of Pediatrics, Inc.

INFORMATION ON CERTIFICATION IN CARDIOVASCULAR DISEASE BY THE AMERICAN BOARD OF INTERNAL MEDICINE

The applicant should be of good character and excellent standing in his community, as attested by letters from sponsors of known integrity. The Committee has disapproved applications from men whose training and achievements have seemed otherwise acceptable, but who have been regarded by their colleagues as unethical or otherwise undesirable influences in their communities.

The applicant should have reached a state of maturity, compatible with the acquisition of sufficient factual knowledge and experience to form a basis for sound judgment. The Committee believes that it is only unusual individuals who are sufficiently mature for this subspecialty before the age of thirty-five years or less than ten years after graduation from medical school.

The candidate must have given clear evidence of his deep and constant interest in cardiovascular disease over a period of years. The Committee is particularly interested in recommending for examination those applicants whose records indicate that their interest in cardiovascular disease will probably be sustained throughout life, and that their knowledge of the subject will constantly grow. Achievements in the field of research are regarded as evidence of such interest, but publication of articles or prolonged training in research work is not considered essential. Consideration will be given to the circumstances of each applicant's training and experience; those who have been in communities and institutions which offered excellent opportunities for contributions to the knowledge of cardiovascular disease will be expected to have made such contributions. Consideration will be given to the difference in experience of those whose opportunities for research have been more limited.

In most cases it is deemed essential that the candidate after thorough training in internal medicine, shall have received at least one full year of postgraduate education in cardiovascular disease, preferably under the guidance of a person known to be experienced and sound.

Every candidate admitted to the certifying examinations in cardiovascular disease will be expected to possess specialized knowledge of the kind indicated below. This list is by no means complete; it is intended to indicate the nature, rather than the extent, of the knowledge every applicant should have. In terms of its scope it should be regarded as the minimum, not the maximum.

Full and accurate knowledge of the anatomy of the normal and diseased heart, including its relationships to the external chest and to the other mediastinal structures. A comprehensive anatomical knowledge of all important blood vessels including their aberrant locations.

A thorough knowledge of the normal and pathological physiology of the heart and peripheral circulation is considered by the committee to be of fundamental importance.

Detailed knowledge of the diagnostic signs which permit the recognition of all important diseases of the heart and blood vessels, such as arteriosclerosis, arteriosclerotic heart disease, syphilitic heart disease, rheumatic heart disease, contrictive pericarditis, auricular and ventricular septal defects, coronary thrombosis with myocardial infarction, thromboangitis obliterans, Raynaud's syndrome, coarctation of the aorta, aneuryam, patent ductus arteriosus, periarteritis nodosa and lymphedema.

Familiarity with the special methods used in the study of diseases of the heart and blood vessels. In the case of the heart, these include such technics as electro-cardiography and roentgenography; in the case of vascular diseases, such technics as the use of the oscillometer and thermocouple, arteriography, and venography, reflex vasodilatation, the cold pressor test, color changes with elevation, dependency and temperature.

Accurate knowledge of the pathologic changes associated with the more important diseases of the heart and blood vessels, sufficient to enable the candidate correctly to evaluate the pathologic condition from gross specimens of microscopic sections.

Fairly extensive and detailed knowledge of the pharmacology relating to heart and blood vessels. This must include full knowledge of the important relationship of the autonomic nervous system both to the heart and to the peripheral vessels, and the effects of stimulation or paralysis of the various parts of the autonomic system by drugs or by surgical methods. The candidate should be intimately familiar with the use and effects of such important drugs as digitalis, quinidine, heparin, papaverine, epinephrine, dicumarol, penicillin, diuretics and sedatives.

Every candidate should have a sound understanding of the indications for conservative therapy, as well as for surgical procedures, in cardiac and peripheral vascular diseases (patency of the ductus arteriosus, arteriovenous anastomoses, constrictive pericarditis, scalenus anticus syndrome).

INFORMATION ON CERTIFICATION IN GASTRO-ENTEROLOGY BY THE AMERICAN BOARD OF INTERNAL MEDICINE

A. Professional Standing

The candidate must have at least two letters from recognized internists or gastroenterologists, which must attest to the candidate's professional qualifications and ethical standing, whether he is specializing in gastro-enterology and if not entirely, giving an opinion as to approximately how much of his work is devoted to it.

B. Education

1. The candidate must admit proof of adequately supervised training in the recognized gastroenterologic procedures, including gastric and hepatobiliary function tests, proctosigmoidoscopy and gastrointestinal roentgenology (film interpretation).

2. The candidate must present evidence of fulfilment of one of the following requirements:

(a) Formal graduate course in gastro-enterology, full time for at least eight months in a recognized institution.

(*b*) Residency or fellowship for at least one year in gastro-enterology under tutelage of a recognized specialist.

(*c*) In the absence of (*a*) and (*b*), attendance and active participation in a ward service or in a gastrointestinal clinic, recognized in standing, for at least five years.

3. If requirements (*a*) or (*b*) under the above heading has been met, only three years of (*c*) will be required.

C. Practice

At least 60 per cent of the candidate's work must have been devoted to gastroenterology for at least three years before application.

INFORMATION ON CERTIFICATION IN PULMONARY DISEASES BY THE AMERICAN BOARD OF INTERNAL MEDICINE

I. Candidates for certification in pulmonary diseases shall fulfil the requirements of the American Board of Internal Medicine as to:

A. General Qualifications.

B. Professional education.

C. Special training.

II. In Addition to the General Requirements of the American Board of Internal Medicine, candidates shall:

A. Have completed special training period in pulmonary diseases to include at least a year's work in a sanatorium or hospital for tuberculosis and at least another year in the practice of pulmonary diseases in such an institution or in association with an older man competent in this field.

B. Submit an application to the Advisory Board in this specialty, which must be approved by all of the members of this board.

C. Pass the written and oral examinations of the American Board of Internal Medicine.

D. Pass the oral and practical examination in pulmonary diseases.

AMERICAN BOARD OF NEUROLOGICAL SURGERY

A. W. Adson, Chairman, Rochester, Minn.
R. Glen Spurling, Vice Chairman, Louisville, Ky.
Percival Bailey, Chicago.
Leo M. Davidoff, New York.
Leonard T. Furlow, St. Louis.
Francis C. Grant, Philadelphia.
Eric Oldberg, Chicago.
Bronson S. Ray, New York.
James C. White, Boston.
Harry Wilkins, Oklahoma City.
William J. German, Secretary-Treasurer, 789 Howard Avenue, New Haven 4, Conn.

General Qualifications

1. Moral and ethical standing in the profession satisfactory to the board of directors.

2. It shall be discretionary with the board to accept for examination candidates who have been in practice more than six years but whose formal training fails to meet the full requirements.

3. Properly qualified candidates who are permanent residents in and citizens of other countries and are legally qualified to practice medicine there, and who have received their training in neurological surgery in the United States of America or Canada may apply for certification by the American Board of Neurological Surgery.

Preliminary Professional Standing

1. Graduation from a medical school which is acceptable to the American Board of Neurological Surgery.

2. Completion of a surgical internship of not less than one year in a hospital acceptable to the board, or its equivalent in the opinion of the board. (A one year rotating internship does not satisfy this requirement.)

Special Training

A period of graduate study in a recognized graduate school of medicine of not less than three years beyond the year of general surgical training, or in an approved hospital or under a sponsorship acceptable to the American Board of Neurological Surgery for the training of neurological surgeons. The training in clinical neurological surgery must be progressive and not obtained during repeated short periods in a number of institutions. It is preferable that at least two years of this training be had in one institution, and the board will not ordinarily approve periods of training in clinical neurological surgery of less than one year.

This period of special training shall be of such a character that the relation of the basic sciences of anatomy, physiology, pathology, bacteriology and biochemistry is emphasized. Knowledge of these sciences as applied to practice of neurological surgery will be required in the examination. The board will not credit periods of study limited to these basic sciences of longer than six months in fulfillment of this requirement of three years of special training.

Training in diagnostic neurology should be obtained either in correlation with training in neurological surgery or inde-

pendently. The candidate will be required to pass an examination in this subject.

An additional period of not less than two years in the practice of neurological surgery.

The above represents only the minimum requirements of training for the practice of neurological surgery in the opinion of the board.

APPLICATIONS

An application on the official application blank in such form as may be adopted from time to time by the Board of Directors, in order to be considered at any meeting, must be in the hands of the secretary-treasurer of the board not less than sixty days before the date of such meeting.

The secretary-treasurer of the board on receipt of an application shall forthwith make inquiries from those to whom the candidate refers and from such other persons as the secretary-treasurer may deem desirable, after which he shall forward the application to the Committee on Credentials. This committee shall consider the application and other information available and notify the secretary-treasurer its recommendation whether or not the applicant is acceptable. The certification of a candidate shall be approved by a majority of the members of the entire board at any meeting held for such certification.

PAYMENT OF FEES

The fee for certification, with or without examination, shall be $100.

The candidate for examination on filing his application shall accompany it with an application fee of $25. When notified by the secretary-treasurer that he is eligible for examination he shall send the examination fee of $75 to the secretary-treasurer at least two weeks before the date of the examination. The application fee will be returned if the candidate is not accepted for examination.

REEXAMINATION

A candidate who has failed in one examination is eligible for reexamination in the subject, or subjects, in which he failed, within three years, on payment of a reexamination fee of $25. A candidate who has failed in one examination and who does not apply for reexamination within three years or a person who has applied within that time but who has failed a second time will be considered a new applicant.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

WALTER T. DANNREUTHER, President, New York.
JOSEPH L. BAER, Vice President, Chicago.
WILLARD R. COOKE, Vice President, Galveston, Texas.
F. BAYARD CARTER, Durham, North Carolina.
ROBERT A. KIMBROUGH JR., Philadelphia.
DANIEL G. MORTON, San Francisco.
LAWRENCE M. RANDALL, Rochester, Minn.
PAUL TITUS, Secretary-Treasurer, 1015 Highland Building, Pittsburgh 6.
ROBERT L. FAULKNER, Assistant Secretary, Cleveland.

REQUIREMENTS

Each applicant before he may become eligible to receive the certificate of the board or other evidence of recognition:

1. Must have had conferred on him a degree in medicine by an institution of learning approved by the Advisory Board for Medical Specialties and the Council on Medical Education and Hospitals of the American Medical Association.

2. Must establish in a manner satisfactory to the Board of Directors that he is a physician duly licensed to practice medicine, and

(*a*) that he is of high ethical and professional standing.

(*b*) that he has received at least minimal training bilaterally, i. e., in both obstetrics and gynecology. Training in one branch only is not sufficient for qualification. The term "minimal training" as used here is at present defined as meaning at least one year of full time formal training, in the branch of either obstetrics or gynecology relegated to a minor role in a candidate's training program as related to his preference and plans for practice. Effective Jan. 1, 1954, training in each branch must balance to provide a minimum of eighteen months each in obstetrics and in gynecology toward the required total of three years.

3. Must make application for investigation of his credentials and a survey of his character.

4. Must assure the board that he is limiting his practice to obstetrics and/or gynecology and that he intends to continue to do so, except for military duties. Candidates will be accepted only if, on application they have been in practice limited to the specialty for a minimal period of at least two years following completion of their specialty training.

This board will not accept applicants for examination who are not full citizens of the United States or of Canada, though they be residents of either country. Foreign born applicants must have been certified by either the National Board of Medical Examiners or licensed to practice medicine in the United States or Canada by a state or provincial board of licensure. Notarized statements, not original citizenship papers, must be furnished when the application is filed attesting to the fact of full citizenship in the United States or Canada, if the applicant is foreign born. Further, there will be required a probationary period of at least three years from the date of licensure in the practice of medicine in these countries before such a candidate may be admitted to examination.

The board has ruled that physicians who accept male patients in their private or other practice, for operative or other care, cannot be regarded as specialists in obstetrics and gynecology, except by special ruling when this is related to active military duty.

This board deprecates engagement in fields of practice other than that in which candidates profess to be specialists. The board does not exclude from examination, however, obstetricians-gynecologists who practice abdominal surgery and urology in the female, as well as breast surgery, because of the correlation of these activities.

Military service or any other similar patriotic service, such as work with Selective Service boards, have not been construed as nonlimitation of practice in violation of the board regulations. Officers (Regulars or Reserves) certified by this board and on duty with "Family Dependent Services" are expected to be permitted to limit their work to the specialty, as in civilian life, and not to be engaged regularly in general or other practice.

The minimal requirements for all candidates will be uniform as follows:

1. Completion of at least one year intern service in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association. This need not be a general rotating internship, although this latter is preferred.

The board accepts the fifth or "intern" medical school year required at some schools in lieu of the usual fifth or intern "clinical training" year following graduation.

2. A minimum of seven years of training and practice after the intern year, to include at least three years of residency training in obstetrics-gynecology in approved institutions, or adequate preceptorship training. Following completion of acceptable training (residency or preceptorship) two years of post training practice limited to the specialty are required.

When the applicant offers a preceptorship as part of his training, the length of required time in such preceptorship, and when his post training practice begins, must be decided individually for each case by the Credentials Committee.

Post training practice period may include full time medical school or other positions within the specialty, actual practice within the specialty as an assistant, associate, or independently.

The Council on Medical Education and Hospitals of the American Medical Association listed for the first time in 1950 (J. A. M. A., April 15, 1950, pages 1216, 1204-1211), 149 inspected and approved one year residencies in general surgery "as offering training in general surgery . . . in preparation for residencies in surgical specialties." Such residencies are recommended by this board as desirable additional preparation, particularly when they provide opportunities for training in abdominal surgery.

Periods of residency in obstetrics-gynecology in excess of the required three years will not be accepted as a substitute for any part of the two required years of post training practice except in cases of men advancing from their residency training into and planning to remain in full time teaching positions in medical schools and their affiliated hospitals.

3. Basic science training may be acquired separately from or concurrently with clinical training. Basic science training should emphasize the relation of the basic sciences, anatomy, pathology, physiology, biochemistry and bacteriology, to the application of surgical principles which are fundamental in all branches of surgery. In addition, the candidate must understand and be trained in the following subjects: viz., the care of emergencies, shock, hemorrhage, blood replacement, electrolyte and fluid balance, protein and nitrogen balance, choice of anesthetics, chemotherapy, acidosis and alkalosis, narcotics and hypnotics, wound healing, and so on.

SPECIAL CREDITS AND RULINGS

The board conformed with the general acceleration in programs in medical education in that it will accept a period of nine "accelerated" months as an academic year in satisfying the requirement for each of three years of residency training. Such allowances can be made only for services during the wartime period of the official "accelerated program" and are not made for services before 1943 or after the discontinuance of this acceleration in 1946.

No formal graduate courses are required. If taken, credit will be limited to six months.

An applicant entering military service during any national emergency and assigned to work in obstetrics and/or gynecology or in general surgery under conditions acceptable to the Credentials Committee may receive credit up to a maximum of six months applicable toward his three required years of specialty training. He should specifically request such credit in making his application.

An applicant serving under military orders in an Army or a Navy hospital in an obstetrical and/or gynecological service under supervision will be given the same credit as if he were working under a preceptor, if these departments are supervised by diplomates of this board or recognized obstetricians-gynecologists. He may obtain full residency credit if such hospital is officially approved and listed for residency training in this specialty. The Credentials Committee of the board will review and give consideration to each case. Special request must be made for such credits.

APPLICATION AND FEES

Application must be made on a special blank which will be furnished by the secretary's office and must be forwarded with the other required credentials and the application fee to the secretary's office at least ninety days prior to the scheduled date of the Part I examinations.

Candidates who have not had a minimum of three years' formal residency type of special training should utilize Preceptorship or Supplemental Training forms, obtainable from this office to submit in addition to the regular application form.

The application fee is $25 and is not returnable.

The examination fee is $100 and is payable when the candidate is notified of acceptance for examination. This fee is not returnable after the candidate has been officially accepted by the Credentials Committee and notified to report for examination.

If the candidate fails the Part II examination on his original application, he may exercise the privilege of one reexamination (see Examinations, Part II) but he will be required to pay a fee of $25 for such reexamination on making request that his application be reopened for this purpose. This ruling is effective on applications originally made after June 1, 1949.

The fees have been carefully computed on a basis of cost of examinations and are used entirely for administrative expenses. Examiners and associate examiners serve as such without compensation other than actual expenses.

Many prospective candidates write the secretary's office outlining in their letters their training qualifications and asking informally if they are eligible if this training has been sufficient and, if not, what is still lacking. Any candidate should be able to make a fair estimate of his eligibility after studying these requirements.

Individual officers and directors cannot and will not make any such estimates or rulings. These are made only by the Credentials Committee after reviewing such requests made on a special form provided for this purpose, and submitted to the secretary for an appraisal with the fee of $15 to cover clerical expenses involved.

This form is desigated the "Application for Appraisal of Incomplete Training."

Personal interviews cannot be granted by the secretary or other directors of the board unless requested by the board.

All candidates must comply with the board regulations in effect for the year in which the examination is taken, regardless of when the original application was filed.

Applicants declared ineligible for admission to examination may request reopening of their applications within two years of the filing date without payment of an additional application fee. When a candidate requests that his application be reopened, he must supply the board with information to justify such further consideration. A request for the reopening of an application declared ineligible by reason of insufficient training, nonlimitation of practice or similar items may not be approved in less than two years, although application may be made as specified above to avoid payment of an additional fee. This approval time may be reduced under exceptional circumstances. The request must have adequate supporting evidence of additional training and experience to warrant reconsideration. Preceptorship or Supplemental Training blanks should be used for such reports, and these will be supplied on request.

After two ineligibility or postponement rulings on any candidate's application, an entirely new application must be submitted (with or without fee, according to current requirements) in order to bring data down to date. The essential feature of this should be evidence of additional training and experience.

Applicants declared eligible but who fail to exercise the examination privilege within three years of the date of filing the application are required to file a new and current application and to pay a new application fee.

Candidates should offer as sponsors or references two diplomates of this board with whom they are presently in contact, rather than men under whom they served as residents only. It is required that sponsors be from the candidate's community and currently acquainted with the candidate and his ability in his practice of the specialty.

On notice of acceptance for admission to examination, examination fee is due and also case records which should be shipped by the candidate to the secretary's office as soon as possible and not later than the date of the Part I written examination.

The candidate should make immediate acknowledgment of his notice of acceptance, at which time he will notify the secretary's office approximately when to expect his case reports.

EXAMINATIONS

Part I examinations are scheduled annually for the first Friday in February. Grades cannot usually be mailed from the secretary's office until after April 1 following the examination. Arrangements will be made for candidates to report in any convenient city where there may be a diplomate of this board to conduct or supervise the written examination which will be sent out from the board's office under sealed cover.

Special arrangement will be made through senior officers for conducting the written portion of the Part I examination for men in military service. Such candidates are requested to keep the secretary's office informed at all times of changes in their mailing addresses.

All applicants accepted for examination will be required to obtain a passing grade in both the written examination and a review of case reports (Part I), before becoming eligible for the oral-clinical and pathology examinations (Part II). The passing grade for the written examination and case reports is 75 per cent. A candidate whose grade in either or both falls below 75 per cent is conditioned.

Reexamination for the removal of conditions in Part I may be taken after one year but within three years after the first failure, without payment of an additional fee.

Candidates who successfully complete the Part I examination proceed automatically to the Part II examination held later in the year.

Candidates appearing for reexamination under a new application after two previous failures will not be required, if they have passed all or part of the Part I examinations on their first application, to repeat such examination items already successfully cleared.

PART I

Examination consists of:

1. A comprehensive written examination, conducted annually, including questions on both obstetrics and gynecology and related basic sciences. The written examination will be limited to a maximum period of three hours.

2. The filing, not later than the date of the written examination, of twenty-five obstetrical and gynecological case reports, in condensed form. Five cases may concern major illnesses, not necessarily operative. All must be of patients for whom the candidate was personally responsible.

Grades on case reports submitted for review prior to the written examination will be announced simultaneously with those of the latter; candidates who take the written examination but fail to submit case reports on or before the date of the written examination cannot be given the grade on the latter until their case reports have been received and graded.

PART II

The oral-clinical and pathology examinations given all candidates are conducted by the entire board and the associate examiners usually near the time and place of the annual meeting of one or more of the national societies represented on this board. Advance announcements of examination dates and place will be made in medical journals throughout the country.

Examination consists of:

1. Oral examination before two to four examiners.

An endeavor is made to adapt the details of the oral examination to each candidate's experience and practice. The examination is particularly directed to ascertain his familiarity with recent obstetrical and gynecological literature, the related basic sciences, the breadth of his clinical experience, and his general qualifications as a specialist in obstetrics and gynecology.

2. Pathology examination.

The candidate is expected to identify and to discuss several obstetrical and gynecological pathologic specimens and sections.

Examiners report orally on each candidate to the assembled board, after which the results of their investigations are considered jointly by the entire board and associate examiners. After a general consideration of the details of the candidate's oral and pathology examinations, including a review of his capability and general adaptability, the candidate is passed or failed by the entire board.

The final action of the board is based on the candidate's ethical and professional record, training and attainments, as well as on the results of his formal examination.

When a candidate fails in Part II of the examination, he is not required to repeat Part I but is required to repeat Part II only. One reexamination may be taken within three years of the original examination and first failure without formal reapplication papers. Request for reopening of the candidate's original application must be filed with a reexamination fee of $25 (See Application and Fees). Data regarding additional training or experience and medical school or hospital appointments acquired in the interim must be cited in the letter and verified on a Supplemental or Preceptorship Training Form obtained from the office of the secretary of the board.

The reexamination fee will be effective only on original applications filed subsequent to the date of this announcement, namely, June 1, 1949.

The candidate may reappear at the examination following the one failed by him. The board may, at its discretion, deny the candidate the privilege of reexamination. Requests for admission to reexamination must be accompanied by statements covering additional training, or opportunities for supervised clinical experience since the previous failure to justify such readmission.

Failure to exercise the privilege of reexamination within three years entails the filing of a new application with the usual application and examination fees.

After two failures in either Part I or Part II on the first application, the candidate may reapply and be readmitted to examinations once only. Exceptions to this ruling can be made only by action of the entire board in annual session, usually to be based on evidence of additional training and experience sufficient to warrant such action.

CASE REPORTS

Case reports are to be sent by the candidate to the secretary as soon as possible after receiving notification of eligibility, and not later than the date of the Part I written examination.

Twenty-five important obstetrical and gynecological case reports, in condensed form, are required. Five cases may concern major illnesses, not necessarily operative. These reports must include a variety of material rather than a number of reports of one type and must be of patients treated within four years of the date of the candidate's application. The number of case reports from one residency's service should not be more than half of the total number.

Men holding full time medical school faculty appointments may submit half their case records from this full time, nonprivate practice, but post training service. (See Requirements.)

The candidate should prepare and maintain in his possession a carbon copy of his case records in case of possible loss in shipping.

These reports are not to be copies verbatim from hospital records, but should be in condensed form.

Evidence of adequate follow-up examination pertinent to each individual case must be submitted.

The candidate should submit separate verified index lists, in duplicate for each individual hospital at which operations were performed. All of these must be formally signed by the responsible hospital official (preferably the hospital superintendent), attesting in each instance that the candidate was the operator.

The following items should be observed:

1. Each case report should be headed by identifying information corresponding with that of the index lists, including sequence number, designation as a "residency" or "own practice" case, and so on.

2. The report of the case should begin with: (*a*) preoperative diagnosis and (*b*) postoperative diagnosis (based on findings).

3. The report should be in condensed form, not reported in detail. Follow-up findings of not less than six months are essential. Omissions of follow-up examinations must be explained and justified.

4. Obstetric reports which do not include essential pelvic measurements and note of methods used, will be considered incomplete.

5. Critical summary or analysis of each report with critical deductions derived from correctness or incorrectness of candidate's procedures and from final results must be a final part of each report. Lacking such summary, reports will be considered incomplete and will not be graded.

PRECEPTORSHIP TRAINING

It should be recalled by all concerned that credits for graduate training may be obtainable in certain instances for residency or assistantship service in hospitals not officially approved for residency training. Each such case must be individually considered, and credits will be largely dependent on the teaching qualifications of those in charge of the service, and the clinical facilities of the hospital in question.

As a substitute for part of the required total of formal residency training, service with a qualified obstetrician-gynecologist preceptor, preferably one who has been certified by the board, may be acceptable. The exact time basis for this has not been specified, and each case must be reviewed and decided individually by the Credentials Committee after the application is submitted in the regular manner. The time allowance for this type of training will vary with the amount of work done with the preceptor. It is unusual for more than six months' credit to be given for one year of preceptorship training.

An acceptable preceptor is a specialist in obstetrics and gynecology of long experience certified by this board. His volume of office and hospital practice must be large enough to offer ample opportunity for the candidate's training. Preceptor training should include participation in procedures of office and hospital practice, including operative and obstetric responsibilities, with adequate time devoted to the studies of basic sciences and pathology and the study of current literature pertaining to this specialty. The preceptor should supervise closely the candidate's work and keep an informative record of the candidate's performance in order to facilitate the board's efforts in evaluating the adequacy of the candidate's training.

Candidates who propose to offer preceptorship training for any part of their necessary credits before this board should request Preceptorship Training forms to be sent them by the office of the board in addition to the application blank. These forms are to be filled out by the candidate, executed by the preceptor and returned by him directly to this office, with a covering letter amplifying any of his statements or the data contained in the preceptorship form.

The post training practice requirement cannot be considered as being carried on concurrently with preceptorship training. It must be dated from the time when a candidate is considered by his preceptor and the board, as having completed his training. The candidate need not discontinue or change the status of his assistantship to establish these dates. The Credentials Committee is not likely to allow more than six months' training credit to be given for each year of preceptorship training as compared with the more intensive formal residency training.

CERTIFICATION

Each certificate granted or issued does not of itself confer or purport to confer on any person any degree or legal qualifications, privileges or license to practice obstetrics or gynecology, nor does the board intend in any way to interfere with or limit the professional activities of any duly licensed physician. Its chief aim is to standardize qualification for specialists in obstetrics and gynecology, and to certify as specialists those who voluntarily appear before the board for such recognition and certification, according to its regulations and requirements.

The board does not subscribe to any hospital rule that certification is to be required for medical appointments especially in ranks lower than chief or senior staff of hospitals, or associate professorship in schools of medicine, for the obvious reason that such appointments constitute desirable specialist training.

Even though certification or its full equivalent may be considered a desirable requisite to appointment in key positions, as on the senior or chief staff, particularly of hospitals expecting to conduct approved services for training of residents, it was never intended by this board that certification should be required by any hospital as a prerequisite to appointment, especially in such lesser positions.

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Address all communications to the American Board of Ophthalmology, Cape Cottage, Maine.

REQUIREMENTS

All candidates must comply with current board regulations regardless of time of filing application.

The secretary is not permitted to make decisions as to requirements. These rulings are made only by the Committee on Credentials after reviewing the candidate's formal application.

PREREQUISITES

1. High ethical and professional standing.

2. Full citizenship in the country where the candidate practices. (Limited to countries of North and South America, their possessions and territories.)

3. A degree from a medical school of high standing, satisfactory to the board and approved by the Council on Medical Education and Hospitals of the American Medical Association. An applicant whose training has been received outside of the United States and Canada must present credentials satisfactory to the board and is required to have the certificate of the National Board of Medical Examiners if he has been in practice less than ten years.

4. Completion of an internship of not less than one year in a hospital approved by the same Council.

5. Not less than thirty-six months (a total of sixty months is required of candidates practicing both ophthalmology and otolaryngology) of combined study, training and practice of ophthalmology in approved medical schools, hospitals, clinics, dispensaries, laboratories, preceptorships and private practice.

GENERAL REQUIREMENTS FOR ALL CANDIDATES

1. Application forms must be filled out completely and accurately. Letters of endorsement, together with any other required credentials, must be sent to the secretary's office before the deadline date.

2. Fee of $100 remitted with application.

3. A list of papers or books published.

4. Written qualifying test.

5. Practical examination.

6. Special review of ophthalmic surgery.

7. Membership in the American Medical Association, or such other societies as are recognized for the purpose by the Council on Medical Education and Hospitals of the American Medical Association.

FEES

For written test and original examination, $100 (as mentioned previously).

Repeating Written Qualifying Test, $65.

Repeating Practical Examination, $65.

Single conditions, Written or Practical (except surgery), $35.

Repeating Practical Surgery, $35.

Two or more conditions, $35.

Written qualifying test must be taken within three years of date of application. Thereafter new application and fee are required.

The fees have been carefully computed on a basis of cost of examinations and are used entirely for administrative expenses. Examiners serve without compensation other than actual expenses.

SPECIAL TRAINING

This shall include:

1. Graduate study of the basic medical sciences which are fundamental to the intelligent practice of ophthalmology, particularly: anatomy, histology, embryology, optics, physiologic optics, visual physiology and psychology, pathology, bacteriology, pharmacology, disorders of ocular motility and binocular vision, perimetry, and in the skilful adjustment and use of instruments such as the ophthalmoscope, retinoscope, slit lamp and microscope. Mere factual knowledge is not sufficient; the candidate must have had training in the application of these subjects and in their use in clinical ophthalmology, especially in refraction.

2. Active clinical experience in approved hospitals, clinics, dispensaries and private practice. Library and laboratory facilities should be utilized for intensive study of cases.

The subject matter to be covered under 1 and 2 is outlined in the syllabus prepared by the board.

These requirements may be met in various ways:

BASIC STUDIES

Anatomy
Embryology and developmental abnormalities
Biochemistry
Pathology
Bacteriology and immunology
Optics and physiologic optics
Ocular physiology
Relation of eye to general diseases
Therapeutics and pharmacology
Neuro-ophthalmology

These may be covered by:

A. *Graduate Study.*—By a curricular course in the basic sciences related to ophthalmology in an approved graduate medical school.

B. *Postgraduate Study.*—By courses in individual basic sciences related to ophthalmology as given at various approved institutions. The Home Study Course of the American Academy of Ophthalmology and Otolaryngology is recommended.

C. *Residency.*—By advanced study of these subjects during a residency and by correlation of the principles involved with clinical problems.

D. *Research, Fundamental and Clinical.*—By the detailed study, under supervision or as assistant to an experienced research worker, of some problem or topic which brings the basic sciences into direct relation with the concrete clinical problem.

CLINICAL EXPERIENCE

A. By residency in an approved hospital. The most desirable of these residencies have regular lectures covering the entire field of clinical ophthalmology and of the basic subjects as applied in clinical practice. Many of these have seminars at which residents report cases which they have carefully worked up. These are discussed by the other residents and by the staff and the method of presentation as well as the subject matter critically considered.

B. By residencies in hospitals where regular instruction by lectures and quizzes and seminars is not available. The syllabus issued by the board will guide the resident in his selection of topics to be studied.

C. By fellowships in ophthalmology.

D. By preceptorship with a well trained and critical ophthalmologist.

E. After completing a residency it is of great advantage to secure a position in a clinic as fellow or assistant. This may require only part time work, but due credit will be given. Its value to the student depends on how much study he puts into it and on how competent his seniors are.

F. Research under competent critical and sympathetic supervision will give first hand insight into (1) the methods whereby old knowledge was and new knowledge is acquired and (2) the pitfalls which accompany attempts to enlarge the sphere of knowledge. Only in this way can the candidate evaluate basic facts in the intelligent critical way which is expected of the specialist in practice.

G. The candidate who cannot secure the type of residency he desires should not despair, for his progress depends far more on how he uses his opportunities than on the opportunities themselves.

WRITTEN QUALIFYING TEST

Before being accepted for examination, candidates are given a written test to ascertain their qualifications. The questions may cover any part of ophthalmology and are especially devoted to the basic studies as listed above. The written test will be given in several principal cities at the same time. Choice of cities is determined largely by the geographical distribution of candidates. Candidates found acceptable will be notified to appear for a subsequent practical and clinical examination in ophthalmology.

EXAMINATIONS

Examinations usually are held annually at or near the time and place of the meeting of the American Medical Association; also at other times and places at the discretion of the board, depending on the number of applications from any region.

The board reserves the right to limit the number of candidates to be admitted to any one examination.

Candidates must be examined in all subjects listed in the sections titled Basic Studies and Practical and Clinical Examination. The time spent in preparation will count less than the knowledge and experience acquired as shown on examination.

PRACTICAL AND CLINICAL EXAMINATION

The subjects of the practical examination are as follows: (1) External Diseases, (2) Ophthalmoscopy, (3) Histopathology, (4) Refraction, (5) Motility, (6) Ophthalmic Surgery, (7) Perimetry.

1. *External Diseases of the Eye and Adnexa.*—Various methods of examination, diagnoses and treatment.

2. *Ophthalmoscopy.*—Patient will be examined by the candidate and the findings described or drawn. A candidate is required to bring his own ophthalmoscope.

3. *Pathology.*—The candidate will demonstrate familiarity with general clinical pathology as well as the etiology, pathology and bacteriology of diseases of the eye. He will be asked to examine microscopic slides and to recognize normal and pathologic histology of the eye.

4. *Refraction.*—A candidate will examine patients and show mastery of various methods, and of the principles of refraction and of retinoscopy. He should bring his own retinoscope.

5. *Motility.*—The candidate will demonstrate on patients his familiarity with routine methods of examination and diagnosis.

6. *Ophthalmic Surgery.*—A candidate will demonstrate his surgical technic on animal eyes. He must bring his own equipment for performing an extracapsular combined extraction of the lens.

7. *Perimetry.*—The candidate will be given an opportunity to examine patients by use of the arc perimeter, the tangent screen and the stereocampimeter. He may also be required to interpret charted fields.

SPECIAL REVIEW OF SURGICAL CASES

The board now requires of all candidates a list of ophthalmic operations performed within two years prior to examination. This list is to be presented with application.

The operations should be listed in groups of each type of surgery. The numbers of operations in each group must be totalled and the total number of all operations shown. This list must contain the following data:

1. Date.
2. Condition or conditions for which operation was performed.
3. Name and character of operation.
4. Identification by hospital or clinic number, or the name of a consultant or confrere who was present at the time of operation.

Circumstances which prevent any candidate from fulfilling this requirement should be fully explained, with detailed statement of candidate's surgical experience.

CERTIFICATION

The decision of the board is final as to the candidate's passing, failure or partial failure. The final action of the board is based on the candidate's ethical and professional record, training and attainments, as well as on the results of his formal examinations.

REEXAMINATION

Candidates may be reexamined as often as they desire on satisfactory evidence of adequate additional preparation and payment of reexamination fee. A minimum of one year must elapse between examinations when a candidate is conditioned in one or more subjects. A minimum of two years additional preparation is required of candidates who fail in all subjects. The board may, at its discretion, deny the candidate the privilege of reexamination.

NO DEGREES OR LEGAL RESTRICTIONS

Each certificate granted or issued does not of itself confer or purport to confer on any person any degree or legal qualifications, privileges or license to practice ophthalmology, nor does the board intend in any way to interfere with or limit the professional activities of any duly licensed physician. Its chief aim is to elevate the standards of qualification for specialists in ophthalmology and to certify as specialists doctors of medicine who appear before the board for such recognition and certification, according to its requirements and regulations.

AMERICAN BOARD OF ORTHOPEDIC SURGERY

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RULES AND PROCEDURES

I. GENERAL ELIGIBILITY REQUIREMENTS

1. Satisfactory moral and ethical standing in the profession.

2. Graduation from a medical school of the United States or Canada, recognized at the time of graduation by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from a foreign school considered satisfactory by the aforementioned Council.

3. Completion of an internship of not less than one year in a hospital approved at that time by the Council on Medical Education and Hospitals of the American Medical Association or, if trained in foreign countries, in institutions considered satisfactory by The American Board of Orthopaedic Surgery.

4. Starting in 1952 and continuing subsequently, applicants taking Part I examinations for the first time must have completed not less than one year of resident training in general surgery in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association, or present evidence of comparable training in general surgery considered satisfactory by the American Board of Orthopaedic Surgery. The minimum of one year of training in general surgery is in addition to the minimum of one year of internship.

5. Completion of formal requirements for Part I or Part II examinations. These formal requirements can only be satisfied by training in one of two categories:

(*a*) resident orthopaedic training

(*b*) preceptorship training

Applicants may no longer be admitted to examinations, or be certified, on the basis of extensive specialized practice and/or teaching appointments and/or many short unapproved courses.

6. Restriction of practice to orthopaedic surgery.

II. REQUIREMENTS FOR PART I EXAMINATION

1. Completion of and compliance with aforementioned general eligibility requirements.

2. Citizenship in the United States or Canada, or possession of citizenship papers showing intent to become a full citizen.

3. Satisfactory completion of a minimum of one year of approved training in orthopaedic surgery under a program of resident orthopaedic training, or completion of a minimum of five years of orthopaedic training under a preceptorship program.

Starting in 1952 and continuing subsequently, in addition to the aforementioned requirements, applicants taking Part I examinations for the first time will be required to have satisfactorily completed a minimum of two years of approved training in orthopaedic surgery instead of one year previously required. Applicants training on preceptorship programs will still be required to have completed a minimum of five years of orthopaedic training.

4. Evidence of competence in training.

5. Approval for examination by the Committee on Eligibility of The American Board of Orthopaedic Surgery.

III. REQUIREMENTS FOR PART II EXAMINATION

1. Successful completion of Part I examination.

2. Full citizenship in the United States or Canada.

3. License to practice in the United States or Canada.

4. Membership in the American or Canadian Medical Association.

5. Satisfactory completion of a minimum of three years of approved resident training in orthopaedic surgery, plus a minimum of two subsequent years of practice period for applicants trained under resident orthopaedic training programs.

6. Satisfactory completion of a minimum of five years of practice period for applicants trained under preceptorship programs.

7. Evidence of competence in practice.

8. Approval for examination by the Committee on Eligibility of the American Board of Orthopaedic Surgery.

IV. APPLICATION AND EXAMINATION FEE SCHEDULE

1. Application for Part I, fee $15.00, not returnable.

2. Examination, Part I, fee $35.00, payable only if approved for examination. Approved candidates failing to appear for scheduled examinations forfeit fees.

3. Application for Part II, fee $15.00, not returnable.

4. Examination, Part II, fee $50.00, payable only if approved for examination. Approved candidates failing to appear for scheduled examinations forfeit fees.

5. Reexamination, Part I, fee $35.00; for Part II, fee $50.00. No application fee is required for reexamination.

V. APPLICATIONS

1. Applications for Part I examinations must be received in the office of the secretary of the board before December 31st of the year preceding the examination.

2. Applications for Part II examinations must be received in the office of the Secretary of the Board before August 15th of the year preceding the examination.

3. Notices of acceptance for admission to the Part I examinations are mailed to eligible candidates during the month of February in the year of the examinations.

4. Notices of acceptance for admission to Part II examinations are mailed to eligible candidates during the month of November in the year preceding the examination.

5. Questions of eligibility for examinations are decided by the Committee on Eligibility of the board. This Committee meets twice yearly. The secretary is not empowered to rule on questions of eligibility.

VI. EXAMINATIONS

1. Part I examinations are held once yearly, usually in April or May, in various centers in the United States.

2. Part II examinations are held once yearly, usually in one center, immediately preceding the meeting of The American Academy of Orthopaedic Surgeons.

VII. CERTIFICATION

1. Applicants who successfully pass Part I examination will receive no certificate but will be notified by letter by the secretary.

2. Applicants who successfully pass Part II examinations receive a Certificate of the Board which states that they have been found qualified to practice the specialty of orthopaedic surgery in those fields in which they have been trained and examined.

3. Candidates obtaining certification without training and examination in children's orthopaedic surgery may subsequently

add certification in children's orthopaedic surgery by completing a minimum of one year of approved resident orthopaedic training in children's orthopaedic surgery and successfully passing examination in that field. A practice period of one year is required following completion of resident training, prior to examination for additional certification.

VIII. Approved Residencies

1. In the United States, resident training must be taken in institutions approved for resident training in orthopaedic surgery by the Council on Medical Education and Hospitals of the American Medical Association. All approved institutions are listed at frequent intervals in the Internship and Residency number of The Journal of the American Medical Association. Lists may be obtained from the American Medical Association and are not obtainable from the board.

2. The integral parts of approved residencies are designated in lists by the following symbols: A—Adult Orthopaedic Surgery; C—Children's Orthopaedic Surgery; F—Fracture Surgery; and S—Basic Science training. Approved lengths of training in institutions is also designated.

3. Candidates electing an additional year of training in adult orthopaedic surgery and fracture surgery in lieu of a year in children's orthopaedic surgery may satisfy requirements by continuing their training beyond the designated approved length of time in institutions approved for adult orthopaedic surgery or adult orthopaedic surgery and fractures.

4. Credit for resident training is not retroactive. Candidates must receive resident training in institutions during periods that such institutions are on the approved list. If candidates are in training at institutions at the time that such institutions become approved, resident training credit may be granted from the start of the training period provided that the program is judged to have been satisfactory.

5. Candidates in resident training, or possessing signed contracts for future resident training in institutions which become disapproved, either in whole or part, receive resident training credit for the entire period during which their contracts are in force.

6. The term "fellow" is considered synonymous with "resident" when the position occupied and the work performed is equal in all functions. Fellowships in institutions having residents, in which training and responsibilities are not equal, are not credited as resident training.

7. Institutions approved for resident training in orthopaedic surgery by the Council on Medical Education and Hospitals of the American Medical Association may, with prior acceptance by The American Board of Orthopaedic Surgery and notification to the Council, utilize the training facilities of institutions not individually approved for resident training by the aforementioned Council, provided that:

(*a*) The training supplements services in the same categories in which the institution responsible for training is approved by the Council.

(*b*) The resident spends at least half of the minimum required time in each category of training in institutions approved by the Council.

8. Foreign residencies must satisfy The American Board of Orthopaedic Surgery.

9. Application for approval of the training facilities of any institution must be made to the Council on Medical Education and Hospitals of the American Medical Association, and inspection of such facilities is made by representatives of the Council. Final approval is a joint function of the Council and The American Board of Orthopaedic Surgery.

IX. Requirements of Resident Orthopaedic Training

1. Institutions approved for full three year programs including all parts of the training requirements may integrate all parts so that they are given concurrently.

2. Institutions now approved for less than three years of orthopaedic resident training should arrange with other approved institutions to provide complete three year programs for all residents. It is planned that such desirable complete programs, with their participating institutions, will be listed separately.

3. The minimum requirements of orthopaedic resident training are as follows:

(*a*) One year of training in adult orthopaedic surgery.

(*b*) Six months of training in the basic sciences.

(*c*) Six months of training in fracture surgery.

(*d*) One year of training in children's orthopaedic surgery or, if elected, an additional year of training in adult orthopaedic surgery and fracture training in place of training in children's orthopaedic surgery.

4. Candidates who elect an additional year of training in adult orthopaedic and fracture surgery instead of a year in children's orthopaedic surgery may satisfy the requirements by taking the additional year of training in adult orthopaedic surgery or six months of adult orthopaedic surgery and six months of fracture surgery, but may not take the entire year of training in fracture surgery.

5. Training in adult and children's orthopaedic surgery must include observation and firsthand experience in diagnosis, treatment, operative and postoperative care of orthopaedic problems.

6. Training in fracture surgery must include observation and firsthand experience in diagnosis, treatment, operative and postoperative care of recent and old fractures.

7. Training in the basic sciences must instill a sound knowledge of anatomy, pathology, physiology, bacteriology and biochemistry as these basic sciences apply to orthopaedic surgery.

8. Candidates may complete the training requirements by training in several approved institutions provided that all the aforementioned minimum requirements are satisfied on approved services.

9. No training period of less than six consecutive months in one institution may be credited toward resident training requirements, except a few short courses on the board's approved list and recognized supplementary services of approved institutions.

10. Candidates in resident training may not engage in private practice.

11. Candidates in resident orthopaedic training must receive their training in institutions and may not receive credit for time spent assisting in private office practice, which is considered as preceptorship training.

12. Candidates trained on accelerated programs during the war years are credited with one year of training for each nine months residency on established accelerated programs.

X. Requirements of Preceptorship Training

1. The preceptor must possess certification by The American Board of Orthopaedic Surgery.

2. The practice of the preceptor must be extensive enough to give the candidate experience in all phases of orthopaedic practice.

3. The preceptor must devote special periods of time each week, outside of the routine hours employed in hospitals and office practice, to assist the candidate with organized courses of study similar to those received during resident training.

4. If facilities and instruction in the related basic sciences are not available, the candidate must spend a minimum of six months as a student in an institution approved for basic science training in orthopaedic surgery.

5. The candidate must train as a full time assistant to the preceptor and may not maintain a separate office or engage in individual practice.

6. The minimum training period in orthopaedic surgery under the preceptorship program is five years, after which time the candidate may file application for Part I examinations.

7. The minimum practice period required for candidates trained under the preceptorship program is five years, after which time the candidate may file application for Part II examinations. This makes a minimum total of ten years from the start of orthopaedic training to eligibility for Part II examinations.

8. The practice period may be satisfied in individual private practice or in assistantship or partnership as desired by the candidate.

9. Candidates who combine preceptorship training with approved resident training receive credit for the preceptorship portion of their training only if it totals a minimum of two years. Two years of preceptorship training is credited as the equivalent of one year of resident credit. The practice period requirement is likewise evaluated so that three years of practice are required if the candidate submits two years of preceptorship and two years of resident training, and four years of practice are required if four years of preceptorship and one year of resident training are submitted.

XI. Sequence of Examinations and Practice Requirements

1. No person may take Part II examinations until after successful completion of Part I examinations.

2. Successful completion of Part I examinations in no way obligates the board to declare a candidate eligible for Part II examinations.

3. Regardless of how extensive or prolonged a practice a candidate may have had prior to completing the training requirements, such time may not be credited toward practice requirements. All practice requirements must be satisfied subsequent to completion of training requirements.

4. Candidates may not be admitted to examination on the basis of prolonged practice but must qualify on the basis of formal training in one of the categories previously detailed.

XII. Practice Requirements

1. Candidates must maintain high ethical and professional standards.

2. Candidates must strive to increase their scientific knowledge.

3. Candidates must limit their practice to orthopaedic surgery.

4. Candidates who have had no approved training in children's orthopaedic surgery must confine their practice to adult orthopaedic and fracture surgery.

5. Candidates trained in resident orthopaedic training are required to complete a minimum of two years of orthopaedic practice subsequent to the completion of their formal training before becoming eligible for Part II examinations.

6. Candidates trained by preceptorship are required to complete a minimum of five years of orthopaedic practice before becoming eligible for Part II examinations. The practice period may be independent of the preceptor.

XIII. Method of Examination

1. Part I examinations consist of a written examination and oral examinations. Material covered includes fundamental surgical principles, elementary fractures and orthopaedic procedures, history-taking and physical examinations as well as those parts of anatomy, pathology, physiology and biochemistry related to orthopaedic surgery. The oral examinations consist of five parts: (*a*) anatomy, (*b*) pathology, (*c*) physiology and biochemistry, (*d*) surgery and (*e*) fractures and orthopaedic surgery.

2. Part II examinations consist of a written examination and oral examinations. Material covered includes advanced work in all phases of orthopaedic surgery. The oral examinations consist of five parts: (*a*) anatomy, (*b*) pathology, (*c*) children's orthopaedic surgery, (*d*) fractures and (*e*) adult orthopaedic surgery.

3. Candidates who have not had approved training in children's orthopaedic surgery will not be examined in that branch of orthopaedic surgery.

4. Candidates are notified by letter as to whether they passed or failed in the examinations. No information regarding results is available until such letters are mailed.

5. Results of integral parts of examinations are not available to either candidates or diplomates of the board.

6. Candidates who have passed Part I examinations are required to take Part II examinations within a ten year subsequent period. If there is a lapse of more than ten years, candidates must repeat Part I examinations and must then become eligible by the requirements then in force.

XIV. Reexaminations

1. Applicants who fail to pass Part I or Part II examinations may be reexamined a second or third time in each Part, but must pay the prescribed examination fee each time of reexamination.

2. Applicants who fail to appear for reexamination within three years after failure must submit new applications with the appropriate fees.

3. After three successive failures in Part I or Part II examinations, applicants must present evidence of additional orthopaedic training satisfactory to the board before submitting new applications.

XV. Military Service

1. Medical officers who have elected service in the military forces as their life careers compete for certification on the same basis as do doctors in civilian practice.

2. Doctors who served for a minimum of one year in the military forces during the war years, between January 1, 1941 and July 1, 1946, are granted a bonus of one year of practice credit, provided that the same time is not used for resident training credit.

3. Applicants who served in military hospitals whose service is judged by the board to have been equal to that of approved resident orthopaedic training, and who were on such service for a minimum of one year between January 1, 1941 and July 1, 1946, may be granted credit for one year of resident orthopaedic training, provided that the same time is not used for practice credit. Applicants requesting such credit must submit completed "Record of Professional Assignments" booklets with their applications.

4. No applicant may be granted more than one year of resident training credit and one year of practice credit for military service during the war years.

5. After July 1, 1946, credit for orthopaedic training must have been or must be obtained by assignment as residents in military hospitals on the approved list for resident orthopaedic training, the same as in civilian life.

6. Medical officers assigned to civilian institutions on the approved list for resident orthopaedic training receive the same credit as do civilian candidates.

7. Medical officers who have elected service in the military forces as their life careers must satisfy the practice requirements by military assignments in which their duties are limited to the practice of orthopaedic surgery.

XVI. Records of Surgical Cases and Inspections

1. Records of a specified number of consecutive surgical cases may be requested by the board in order to evaluate properly the work of an applicant.

2. A representative of the board may visit a community in order to evaluate properly the work of an applicant.

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GENERAL REQUIREMENTS

The following general qualifications of candidates for examination are required by the board:

1. A candidate must have been a citizen of the United States or the Dominion of Canada for three years or more.

(*a*) A candidate must have been a graduate five years or more of a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association.

(*b*) A candidate must be of known good moral character and be ethical in his professional relationships.

(*c*) A candidate trained in a foreign country must be able to give proof of medical and graduate training, comparable to the requirements of the board.

(*d*) A candidate from the United States or the Dominion of Canada must be a member of the American Medical Association or of the Canadian Medical Association respectively or other such medical societies of equal standing as are recognized by the Council on Medical Education and Hospitals of the American Medical Association.

2. Candidates from foreign countries, who have received their training in otolaryngology in the United States are eligible for examination at the discretion of the board, providing they show proof that they are permanent residents and citizens of their respective foreign countries and provided they meet the general academic requirements of the board.

SPECIAL REQUIREMENTS

1. A candidate must have had a general internship, of at least one year, in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association.

2. A candidate must be proficient in the applied basic sciences, fundamental to the intelligent practice of otolaryngology. These include anatomy of the ear, nose and throat, neck, chest, esophagus and nervous system, gross pathology and histopathology, bacteriology, physiology, didactic otolaryngology and the general fundamentals of surgery. (This requirement may be fulfilled in a residency or fellowship service or in an approved organized postgraduate course.)

3. In addition to the general internship, the required clinical training in otolaryngology may have been acquired in any of the following ways:

(*a*) A three years' residency or fellowship in otolaryngology approved by the Council on Medical Education and Hospitals of the American Medical Association.

(*b*) A four years' residency or fellowship in otolaryngology and ophthalmology approved by the Council on Medical Education and Hospitals of the American Medical Association, provided, one half of the training has been in otolaryngology.

(*c*) A two years' residency or fellowship in otolaryngology or a three years' combined residency or fellowship in otolaryngology and ophthalmology, approved by the Council on Medical Education and Hospitals of the American Medical Association, provided this be preceded by at least one year's residency training in surgery or medicine, or by an additional year in an approved internship.

(*d*) At least one year must be spent in private, group or institutional practice of otolaryngology following the period of special training.

4. A candidate may be qualified for examination, at the discretion of the American Board of Otolaryngology, if in addition to the General Requirements and Special Requirements, he has limited his practice to otolaryngology for seven years in association with a hospital staff approved by the Council on Medical Education and Hospitals of the American Medical Association and the board.

5. In exceptional circumstances certain candidates who cannot meet all of the above requirements may be accepted for examination, on recommendation of the Credentials Committee, substantiated by action of the board.

6. A limited certificate in one of the subspecialties of otolaryngology may be issued, at the discretion of the board, to an exceptionally well qualified individual, in the special field in which the certificate is desired.

All applicants must comply with current board regulations, regardless of the time of filing application.

APPLICATION AND FEES

1. Application must be made in duplicate on special blanks procured from the secretary. The completed application blanks must be returned to the secretary, together with the other required credentials, at least one hundred and twenty days in advance of the examination at which the candidate desires to appear.

2. The applications must be accompanied by two small photographs of the candidate, together with verification of the period of enrolment from the institutions where training in otolaryngology was obtained, and the names of two or more otolaryngologists, preferably diplomates of the board, from the vicinity of the candidate's place of residency, to be used as references.

3. The fee for the examination is $100, no part of which is returnable. Of this sum $25 must accompany the application. No application will be acted on until the $25 application fee is received. The balance of the fee—$75—must be paid to the secretary on notification that the candidate has been accepted before an appointment is given for an examination. A re-examination fee of $50 is required of candidates conditioned in one or more subjects.

4. The fees have been carefully computed on a basis of cost of examinations and are used entirely for administrative expenses. Examiners serve without compensation other than actual expense.

5. The application remains valid for three years. An applicant must appear for examination within this time or forfeit the fee.

6. Candidates whose credentials have been found satisfactory and who meet the requirements of the board will be notified ninety days prior to the date of examination. The number of candidates who can be admitted to any one examination is limited. Due to the large number of applications on file, delay in assignment for examination may be inevitable. Appointments will be given in the order applications are accepted and on payment of the balance of the examination fee.

7. The board, acting as a committee of the whole, reserves the right to reject an applicant for any reason deemed advisable and without stating the same, and the action of the board shall be final.

EXAMINATION

Examination will be held at such time and place as the judgment of the board may dictate. Advance notice of examinations

will be given in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and the several special journals devoted to otolaryngology. So far as is possible these will be held biannually at, or near, the time and place of meeting of the American Medical Association, or special societies, and of the American Academy or Ophthalmology and Otolaryngology. The examinations cover from two to four days.

Scope.—This examination encompasses all phases of otolaryngology and peroral endoscopy, including faciomaxillary surgery, and surgery of the neck, excluding the thyroid.

The type of examination is as follows:

1. Clinical, covering the actual handling of patients, including history taking, physical and functional examinations, the use of laboratory and x-ray findings and a discussion of differential diagnosis.

2. Didactic, oral examinations covering all phases of otolaryngology.

3. Gross and microscopic pathology.

4. A written examination may be included when the board deems this advisable.

REEXAMINATION

A candidate who is conditioned in examination may be admitted to a subsequent examination after one year and within the three year period dating from his application, on payment of an additional fee of $50 and one hundred and twenty days' notice of intention to appear is required.

Candidates who have failed in the examination may be accepted for reexamination on recommendations of the Credentials Committee. Satisfactory evidence of further study and progress will be required. A new application must be filed. The fee for reexamination for such candidates is $100, $25 of which must accompany the application. The balance of the fee, $75, will be due on notification of acceptance.

CERTIFICATION

1. A certificate granted by the board does not of itself confer or purport to confer any degree or legal qualifications, privileges or license to practice otolaryngology, nor does the board intend or attempt in any way to interfere with or limit the professional rights and activities of any duly licensed physician. Its aim is to improve the standards of practice of otolaryngology and to certify as specialists those who voluntarily comply with its requirements and regulations.

2. The final action of the board is based on the candidate's ethical and professional record, training and attainments, as well as on the results of his formal examinations.

AMERICAN BOARD OF PATHOLOGY

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A. GENERAL REQUIREMENTS

1. Satisfactory moral and ethical standing in the profession.

2. License to practice medicine or a certificate of the National Board of Medical Examiners.

3. Membership or associate membership in the American Medical Association or membership in a national society acceptable to the board by citizens of the United States. (At present, these include American Association of Pathologists and Bacteriologists, American Society of Clinical Pathologists, American Medical Association, or American Society for Experimental Pathology.) For citizens of other countries, membership in a national medical society of that country is required.

4. The applicant must devote his time primarily and principally to the practice of pathology.

B. PROFESSIONAL EDUCATION

1. Graduation from a medical school in the United States approved by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from a medical school in other countries acceptable to the board.

C. SPECIAL TRAINING AND EXPERIENCE

1. The board admits candidates to examinations who are otherwise eligible and who have had either of two following types of training and experience.

(*a*) After five years, if four of the five years have been in institutions approved by the Council on Medical Education and Hospitals of the American Medical Association or by the board; or

(*b*) After eleven years if none of the training and experience has been in institutions so approved.

2. The specific requirements for those acceptable after five years are as follows:

(*a*) Pathologic anatomy only.

(1) Four years of supervised study and training in an institution approved for residency training in pathologic anatomy by the Council on Medical Education and Hospitals of the American Medical Association or by the board. It is immaterial whether the candidate holds the title of resident or fellow or assistant. Candidates may, at their own election, substitute not to exceed twelve months of a straight or rotating clinical internship or a fellowship or instructorship in any of the preclinical departments of a university for one of the four years. In addition, time, not to exceed twelve months, spent in a department of pathology of an approved school of medicine after the completion of the second year of undergraduate study may be counted for full credit toward the four years.

(2) One additional year which may be a continuation of the preceding or may be independent practice of pathologic anatomy in a hospital approved by the American Medical Association or other institutions acceptable to the board.

(*b*) Clinical pathology only.

(1) Four years of supervised study and training in an institution approved for residency training in clinical pathology by the Council on Medical Education and Hospitals of the American Medical Association or by the board. It is immaterial whether the candidate holds the title of resident or fellow or assistant. Candidates may, at their own election, substitute not to exceed twelve months of a straight or rotating clinical internship or a fellowship or instructorship in any of the preclinical departments of a university, for one of the four years. Candidates, holding also a master's or doctorate degree in a special field of clinical pathology (bacteriology, serology, chemistry, parasitology or hematology) may obtain time credit for not more than twelve to twenty-four months toward the four years for this work, regardless of whether it was taken before or after the medical degree. The evaluation of time credit will depend on how much of the broad field of clinical pathology was covered in the graduate work.

(2) One additional year which may be a continuation of the preceding or may be independent practice of clinical pathology in a hospital approved by the American Medical Association or other institutions acceptable to the board.

(*c*) Pathologic anatomy and clinical pathology.

(1) Four years of supervised study and training divided as follows:

(*a*) Two years of supervised study and training in pathologic anatomy as outlined in the preceding paragraph 2 (*a*) (1).

(*b*) Two years of supervised study and training in clinical pathology as outlined in the preceding paragraph 2 (*b*) (1). Candidates declared eligible before July 1, 1952 may at their own election substitute one year (twelve months) of a straight or rotating clinical internship for one year of this special

training in clinical pathology. After July 1, 1952, all candidates applying for both pathologic anatomy and clinical pathology will be required to have two years of supervised training in clinical pathology.

(2) One additional year which may be a continuation of the preceding or may be independent practice of both pathologic anatomy and clinical pathology in a hospital approved by the American Medical Association or other institutions acceptable to the board. After July 1, 1952, candidates who elect to claim credit of one year for a clinical internship must take this fifth year as supervised study and training in clinical pathology in institutions approved for residency training in clinical pathology by the Council on Medical Education and Hospitals of the American Medical Association or by the board. Candidates declared eligible after July 1, 1952, who do not take a clinical internship, may, after four years of training as outlined in 2-(1)-(*a*) and (*b*), spend the fifth year in independent practice in an institution or laboratory acceptable to the board.

Note.—As outlined in the preceding paragraphs, the total time requirements of the board are unchanged after July 1, 1952, namely, five years of study or practice after graduation from medical school, with exceptions noted in sections 2-(*a*)-(1) and 2-(*b*)-(1).

3. The specific requirements for those acceptable after eleven years are as follows:

a. The practice of pathology under circumstances acceptable to the board for a period of not less than eleven years. At the election of the candidates, not to exceed one year of straight or rotating clinical internship may be substituted for one of the eleven years. For those candidates in this category who have had some special study and training in pathologic anatomy or clinical pathology acceptable under paragraphs 2-(*a*), (*b*) or (*c*), double time credit will be allowed. Thus, if a person has two years of acceptable supervised study and training, only seven years of practice are required.

D. Special Qualifications

1. Prior to Dec. 31, 1947, the board at its discretion certified candidates without examination, if the following conditions were met as of July 1, 1939:

(*a*) That the candidate has been for a period of five years of professional rank in a department of pathology in an approved medical school; or

(*b*) That the candidate had been practicing pathology for ten years in a senior position in a hospital having an adequate department of pathology, approved by the Council on Medical Education and Hospitals of the American Medical Association or in an institution acceptable to the board.

CREDIT FOR MILITARY SERVICE

Credit may be allowed for training and experience in pathology in the federal services during the period July 1, 1940 to June 30, 1947. This credit for training or experience or both is given on an individual basis and will depend on the opportunity the applicant has had, as indicated by his or her medical service record in the specialty of pathology.

After July 1, 1947, credit for those military services will be given on the same basis as it is in civilian institutions, except that the rule in the preceding paragraph will not apply to reserve officers who continue on active duty or are called to active duty after that date.

SUBSPECIALTIES OF PATHOLOGY

(IN FORCE AFTER JULY 1, 1948)

Candidates who have met all general requirements and who have successfully passed the examination in pathologic anatomy and clinical pathology may apply for special designation of a subspecialty of pathologic anatomy or clinical pathology. The board, at its discretion, may approve this application and, after the candidate has successfully passed a prescribed examination, will issue a certificate designating the subspecialty, reading "Pathologic Anatomy (Neuropathology)," "Clinical Pathology (Clinical Bacteriology)," etc.

Candidates who have met all general requirements and who have had five years of special training and experience in a special field of pathology which is acceptable to the board may apply to the board for certification in this special field. The board, at its discretion, may approve this application, and after the candidate has successfully passed a prescribed examination, will issue a certificate reading "Neuropathology," "Clinical Bacteriology," etc.

APPLICATION BLANK AND FEE

Application must be made on the special form which may be procured from the secretary and forwarded with other required credentials and the application fee. An application cannot be given consideration by the board unless it is accompanied by the application fee.

The application or examination fee for candidates is $50. If the candidate fails in his examination he will be admitted to a second examination after one year, but not later than three years, without additional fee. After two reexaminations, the applicant must file a new application and pay an additional fee before a fourth examination will be given.

The application fee of $50 has been determined after careful consideration and is based on actual estimates of the expenses of examination and administration. None of the board members receive any compensation for their services except actual expenses incurred.

If the applicant, for any reason, is deemed ineligible for examination by the board, his fee will be returned; however, the application fee is not returnable after the candidate has officially been accepted for examination and notified to report for the examination.

EXAMINATIONS

Written and oral examinations will be held at the discretion of the board at or near the time and place of national medical meetings. If a number of applications from any region of the country are received, an examination in conjunction with a national medical meeting in that section will be arranged so that the financial outlay of the applicant in meeting the examiners will be as small as possible.

The examinations are to be based on the broad principles of pathology with emphasis on diagnosis, interpretation and technic. The applicant may apply for certification in either pathologic anatomy or clinical pathology or both.

The examinations in pathologic anatomy consist of a written test, an oral examination on gross pathology and a practical examination in microscopic pathology. The examination in clinical pathology consists of a written test and an oral and practical examination in the six phases of clinical pathology: bacteriology, hematology, clinical chemistry, parasitology, serology and clinical microscopy.

DEFINITIONS

1. Pathologic anatomy is that branch of pathology which deals with the morphologic aspects of disease, recognition being given that that definition covers two phases of pathology.

(*a*) The applied phase with special attention to the description and diagnosis of gross and microscopic specimens.

(*b*) The academic phases of teaching and general morphologic diagnosis.

2. Clinical pathology is that branch of pathology which deals with bacteriology, immunology, clinical chemistry, parasitology, hematology, endocrinology and clinical microscopy, the application of the physical and biologic sciences to the diagnosis, prognosis and treatment of disease.

BOARD NOT AN EDUCATIONAL INSTITUTION

The board is in no sense an educational institution and the certificates of the board are not to be considered degrees. Therefore, the certificate does not confer on any person legal qualifications, privileges, or license to practice medicine or the specialty of pathology. The board does not purport in any way to interfere with or limit the professional activities of any licensed physician. Its chief aim is to standardize the qualifications for the specialty of pathology and to issue certificates to those voluntarily complying with the requirements of the board.

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JOHN MCK. MITCHELL, Executive Secretary, 6 Cushman Road, Rosemont, Pa.

APPLICANTS FOR CERTIFICATES

*Requirements for Applicants.**—All candidates for examination for certification must meet the following requirements:

1. Graduation from a Class A medical school.

2. One year of rotating or one year of pediatric internship in an approved hospital.

3. Two years of specialized residency-type training in an approved pediatric center.

On May 1, 1946, it was ruled that at least one year of the two years of required residency training must be a full time pediatric in-patient residency or internship in an approved institution. Because of the shortage of residencies, the board at this time voted that "temporarily" the second year of required residency training might be met in various ways listed below, although the board recommends that whenever possible candidates complete the two years as regular residents.

All applicants admitted to approved graduate or postgraduate courses in pediatrics on or after July 1, 1950 shall receive residency training credit for that number of months actually spent in full time attendance at such courses, in excess of three months and up to a maximum of twelve months. No credit shall be granted for part time graduate or postgraduate courses. Courses of less than three months are credited only under special circumstances.

(*a*) A maximum of three months' credit each is allowed for full time residency type training in allied pediatric subjects, such as pediatric allergy, pediatric psychiatry, pediatric pathology, pediatric cardiology and newborn service.

(*b*) A maximum of six months' credit is allowed for residency training in an approved contagious disease hospital.

4. A subsequent term of two years of specialized study or practice or a combination of the two. Credit for one year toward this requirement is allowed for military service. The maximum credit that any candidate may receive toward the practice requirement for work done prior to the completion of residency training is one year.

Attention is invited to the fact that the primary duty of the resident must be the care of patients under supervision, if full credit in satisfaction of the residency training requirement is expected. Research residencies which involve little or no clinical training are creditable for only three months. Research residencies which include significant clinical training may be prorated to a total of six months for a year of service. Teaching fellowships may not be offered in lieu of residency appointments.

Both research residencies and teaching fellowships are, of course, entirely acceptable in satisfaction of the practice or further study requirement. Portions of a research residency not applicable for residency training credit may be carried over for practice credit.

5. Preceptorships are not accepted for credit toward the residency requirement, but are accepted toward the practice requirement.

The board defines service in a pediatric center as full time devoted to rounded experience in an approved hospital which includes ward and outpatient service, experience with newborn, including prematures, and both therapeutic and preventive pediatrics. It is expected, also, that the service will include adequate graduate training in the basic medical sciences, as well as in the clinical laboratory and public health aspects of the specialty. The time served in pediatric centers need not be continuous or spent in the same institution.

The application fee is $125. This is used entirely for administrative expenses.

The full fee must be remitted with the application. Refund will be made only if the applicant is refused an examination. Applicants who failed an examination may apply for a second examination after two years have elapsed and the candidates have presented evidence of continued study and activity in pediatrics. The fee for a second examination is $75.

Application must be made on special blanks which may be secured from the executive secretary. These should be sent to the executive secretary well in advance of the date on which the candidate expects to be examined. At date of publication, lists are filed approximately one year ahead. No application will be accepted more than a year in advance of eligibility date.

Letters from two competent pediatricians recommending each applicant must be sent to the executive secretary of the board. These letters should not accompany the application, but should be sent directly to the executive secretary. No member of the board, or official examiner, may recommend any applicant.

A list of papers or books published must be sent in with the application blanks.

Certificates granted are in no sense degrees, nor do they purport to confer on any person any legal qualification, privilege or license to practice pediatrics. Neither does the board intend in any way to limit the activities of any licensed physicians. It is merely attempting to standardize qualifications and to issue certificates to those who voluntarily comply with the requirements.

EXAMINATIONS

Examinations will be held at or near the time and place of meetings of the American Academy of Pediatrics, and at other times and places at the discretion of the board, depending on the number of applicants from any region of the country. It is proposed to arrange examinations in different cities so that as little financial burden as possible will be placed on the applicants in meeting the examiners.

The purpose of these examinations is to determine the applicant's competency to practice pediatrics. This board feels that the best impression of an applicant's ability can be obtained by oral examination, although a written test is also given. It precedes the oral examination by an unfixed interval. The written examination is given locally under a monitor. Case reports are not required. The board feels that the clinical and abstract aspects of growth and development are fundamental parts of pediatric training.

INFORMATION ON CERTIFICATION IN ALLERGY BY THE AMERICAN BOARD OF PEDIARICS

The American Board of Pediatrics, Inc., has established certification in allergy as a subspecialty of pediatrics.

Certification in pediatrics by the American Board of Pediatrics is a prerequisite for certification in allergy. Those who already hold certificates of the American Board of Pediatrics and who wish to be certified in allergy must make formal application to the executive secretary of the American Board of Pediatrics. Those who are not yet certified in pediatrics and who desire certification in allergy as well should indicate this in their application to the board as examination in both subjects may be held at the same time.

The application fee for certification in allergy will be $25 in addition to the application fee for pediatric certification.

An Advisory Committee of Allergy has been appointed to act with the Board of Pediatrics in all matters pertaining to the

* To avoid misunderstanding, the board advises all future candidates to communicate with the office of the executive secretary before entering on training.

selection and examination of applicants for subspecialty certification. This committee is identical with the Advisory Committee on Allergy of the American Board of Internal Medicine.

The present members of the committee are:

ROBERT A. COOKE, Chairman, 60 East 58th St., New York.
HARRY L. ALEXANDER, St. Louis.
LESLIE N. GAY, Baltimore.
W. C. SPAIN, New York.
FRANCIS M. RACKEMANN, Boston.
OSCAR M. SCHLOSS, 125 E. 72nd St., New York (pediatric representative).

The Advisory Committee on Allergy has outlined the requirements for applicants who desire examinations in the subspecialty of allergy as follows:

1. Two years, full time, in a satisfactory allergy clinic and its hospital (including training, in both allergy and pediatrics), or

2. One year, full time, in the allergy clinic and its hospital, and two additional years of full attendance on such an allergy clinic and its activities, or

3. Five years, full attendance, on such an allergy clinic and its activities, or

4. Special training under qualified preceptors, solely or in combination with aforementioned types of training, and such other training as might be felt adequate to prepare an individual for the practice of allergy.

It is further the opinion of the committee that clinics for such training should fulfil the following qualifications:

1. They should be in hospitals that have been accepted by the Council on Medical Education and Hospitals of the American Medical Association and by the American Board of Pediatrics for training and certification in pediatrics and for residencies in pediatrics or medicine.

2. The director of the Allergy Clinic shall be a diplomate certified in allergy by the American Board of Internal Medicine, or the American Board of Pediatrics.

When accepted the diplomate will receive from the American Board of Pediatrics a certificate in allergy and will be listed as a specialist in allergy.

Prospective applicants for certification in the subspecialty of allergy may apply to the executive secretary of the American Board of Pediatrics.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION

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ROBERT L. BENNETT, Secretary-Treasurer, 30 North Michigan Ave., Chicago 2.

QUALIFICATIONS FOR ELIGIBILITY TO CERTIFICATION

Each applicant for admission to the examination shall be required to present evidence that he has met the following standards:

GENERAL QUALIFICATIONS

A. Satisfactory moral and ethical standing in the profession.

B. Membership in the American Medical Association or membership in such Canadian or other medical societies as are recognized for this purpose by the Council on Medical Education and Hospitals of the American Medical Association. (Exceptions to the foregoing qualifications shall be made by the American Board of Physical Medicine and Rehabilitation for good and sufficient reasons.)

PROFESSIONAL QUALIFICATIONS

A. Graduation from a medical school recognized by the Council on Medical Education and Hospitals of the American Medical Association.

B. Completion of an internship, preferably of the general rotating type, of not less than one year in a hospital approved by the same council.

SPECIAL TRAINING

A. A period of study after the internship of not less than three years in clinics, dispensaries, hospitals or laboratories recognized by the same Council and by the American Board of Physical Medicine and Rehabilitation as competent to provide a satisfactory training in physical medicine.

B. This period of specialized preparation shall include: (*a*) graduate training in anatomy (including kinesiology and functional anatomy), physics (including radiation physics, electronics and medical instrumentation), physiology, pathology and other basic sciences which are necessary to the proper understanding of physical medicine; (*b*) an active experience of not less than two years in hospitals, clinics, dispensaries and diagnostic laboratories recognized by the Council and the American Board of Physical Medicine and Rehabilitation; (*c*) the written and oral examinations, given by the American Board of Physical Medicine and Rehabilitation, shall include questions concerning the basic sciences, clinical practice and laboratory and public health problems as related to physical medicine.

C. An additional period of not less than two years of study and/or practice in physical medicine.

METHOD OF EXAMINATION

Physical Medicine includes the diagnosis and treatment of disease by means of physical agents. These physical agents include heat, water, electricity, ultraviolet and infra-red radiation and mechanical devices and agents (such as massage and therapeutic exercise).

Physical Medicine has been termed medical applied biophysics. As now practiced, the special field of physical medicine includes (1) the employment of physical agents in diagnosis (as in electrical tests for reaction of degeneration or in the cold pressor test), (2) the employment of physical agents in treatment, (3) occupational therapy and (4) the physical rehabilitation of convalescent and disabled patients.

The physician who specializes in physical medicine must have a thorough knowledge of the basic sciences as related to these subjects as well as clinical practice in the various phases of physical medicine.

Written and oral examinations will be given which will assure the board that the applicant is thoroughly grounded in:

A. The basic sciences including:

(*a*) Anatomy (including kinesiology and functional anatomy). Because of the importance of proper knowledge of the function of muscles in conjunction with the administration of therapeutic exercise and physical reconditioning of convalescent and disabled patients, the applicant will be carefully examined concerning his knowledge in this field.

(*b*) Physics (including radiation physics, electronics and instrumentation). Because physical medicine deals largely with the employment of physical agents, in diagnosis and treatment, the applicant will be expected to be well informed concerning the fundamentals of medical physics. He will be expected to be familiar with such subjects as the physics of heat, ultraviolet and infra-red radiation, and electricity (including the physics of low voltage currents and high frequency currents as employed in medicine). Because of the newer developments in medical electronics and medical instrumentation, the applicant will be examined concerning these subjects.

(*c*) Physiology. The applicant will need to know the fundamentals of physiology, especially the physiology of movement and the physiologic effects of the various physical agents employed in medicine.

(*d*) Pathology. A basic knowledge of pathology as related to physical medicine will be required and questions dealing with this subject will be included in the examination.

(*e*) Other fundamental sciences. The applicant will be examined concerning his knowledge of such subjects as biochemistry and bacteriology as related to physical medicine.

B. The clinical aspects of physical medicine including:

(*a*) Thermotherapy. The various clinical applications of heat and cold both locally and generally should be thoroughly familiar to the applicant.

(*b*) Hydrotherapy. The methods of employing hydrotherapeutic devices and procedures will be covered in the examination.

(*c*) Electrotherapy. Questions concerning clinical, diagnostic and therapeutic uses of the constant current, interrupted currents, sinusoidal and high frequency currents will be included in the examination.

(*d*) Radiation therapy. The applicant will be examined especially concerning the diagnostic and therapeutic uses of ultraviolet and infra-red radiation. (Applicants will not be required to answer questions concerning the therapeutic applications of roentgen rays and radium which are not included in the field of physical medicine but in the field of radiology.)

(*e*) Kinesitherapy. Questions concerning the clinical uses of therapeutic exercise and massage will be included in the examination.

(*f*) Occupational therapy. The applicant will be expected to answer questions concerning the indications for, and clinical applications of, various types of occupational therapy.

(*g*) Physical rehabilitation. Because of the importance of the understanding of the philosophy of convalescent reconditioning and rehabilitation of the seriously disabled person, the applicant will be expected to have a thorough knowledge of the modern developments in these phases of physical medicine.

APPPLICATION

The application form shall contain a record of the candidate's premedical and medical training as well as of internships, graduate study, hospital or dispensary staff appointments, teaching positions, membership in medical societies, medical papers published, and the names of three well known physicians to whom the board may write for professional and character references.

The application shall also be accompanied by one recent signed photograph of the candidate mounted on the application and the registration and examination fee of $50, which fee will cover both the written and oral examinations. (In case of rejection of application, this fee will be refunded with the exception of $10, which will be considered as a registration fee.) An additional fee of $25 will be required when the certificate is issued.

AMERICAN BOARD OF PLASTIC SURGERY

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ESTELLE E. HILLERICK, Clerical Secretary, 4647 Pershing Ave., St. Louis 8.

REQUIREMENTS

GENERAL QUALIFICATIONS

1. Moral and ethical standing in the profession satisfactory to the board.

The board, believing that the practice of "fee splitting" is pernicious, leading as it does to a traffic in human life, will reserve the right to inquire particularly into any candidate's practice in regard to this question.

2. Those whose activities are limited to the practice of plastic surgery.

3. This board will accept as applicants for examination only those who are full citizens of the United States or Canada. Notarized statements, not original citizenship papers, attesting to the fact of full citizenship in the United States or Canada must be furnished by foreign born applicants when the application is filed. Such candidates must have at least two years of practice in plastic surgery in North America after completing the training required by the board.

PROFESSIONAL REQUIREMENTS FOR QUALIFICATION

1. Graduation from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from a foreign school considered acceptable by this board.

2. Completion of an internship of not less than one year in a hospital approved by the same Council, or what would constitute in the opinion of the board the equivalent of such training.

3. Two years of postgraduate work in general surgery beyond the intern year, as a resident or an assistant resident in an approved hospital, or a period of training gained elsewhere judged by the board to be the equivalent.

4. Training in general plastic surgery in an acceptable residency [1] or preceptorship for an additional period of not less than two years, also to be taken in an approved hospital,[1] or under auspices satisfactory to this board.

5. During these years of training following the internship year, a candidate must hold positions of increasing responsibility for the care and management of patients with surgical conditions. When a candidate receives his training in more than one institution, it is equally imperative that he hold positions of increasing responsibility. He must have sufficient operative experience to acquire surgical skill and judgment through the performance of surgical operations with a high degree of responsibility, but under circumstances providing adequate opportunity for consultation and advice.

6. An additional period of not less than two years of practice in plastic surgery. If a candidate elects to spend one or two additional years in approved training in plastic surgery, one year of such training will be credited toward the required two years of private practice if it can be demonstrated that the candidate held a position of increasing responsibility. It is imperative that one year be in actual private practice in such instances.

The above training may be taken as a resident in surgery and in plastic surgery in an approved hospital, or under a preceptorship offering equivalent training. By the latter statement it is meant that one may secure the necessary and specified training as an assistant to an accredited surgeon providing suitable facilities for the education of the candidate are offered.

The period of special training should emphasize the relation of the basic sciences—anatomy, pathology, physiology, biochemistry and bacteriology—to the application of surgical principles which are fundamental in all branches of surgery, and especially to plastic surgery. In addition, the candidate must understand and be trained in the following subjects: the care of emergencies, shock, hemorrhage, blood replacement, electrolyte and fluid balance, choice of anesthetics, chemotherapy, acidosis and alkalosis, narcotics and hypnotics and wound healing.

IMPORTANT NOTE.—The added requirement adopted by the board in July 1949, and which appeared in the Educational Number of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, September 3, 1949, top of page 81, stating that "After Jan. 1, 1953, certification by the American Board of Surgery will be a prerequisite for eligibility for examination by the American Board of Plastic Surgery, has been revoked. Certification by the American Board of Surgery is not necessary

1. An acceptable residency is one which has been approved by the Council on Medical Education and Hospitals of the American Medical Association.

for those seeking certification by the American Board of Plastic Surgery.

Because of vagaries of training, such as changes from one specialty to another, interims of military duty and other service to the country, the aptitude and skill of candidates, the board may, at its discretion, review and make recommendations for or against certification of certain applicants outside of the listed qualifications and requirements.

The board reserves the privilege of requesting lists of operations done solely by the candidate for one or more years, or of requesting special and extra examinations, written, oral or practical, and of requesting any specific data concerning the candidate that may be deemed advisable before making final decision for certification.

Eligibility rulings or an evaluation of a candidate's qualifications or training cannot be made by the secretary or by any one member of the board. Official evaluations of qualifications are made only by the Committee on Credentials and Requirements, or by the entire board where necessary, after a review of the candidate's formal application for such rulings. The applicant must allow at least four weeks for such requests to make the rounds of the committee.

TRAINING FACILITIES

The American Board of Plastic Surgery, in cooperation with the Council on Medical Education and Hospitals of the American Medical Association and the American College of Surgeons, evaluates training facilities in institutions providing acceptable residencies in plastic surgery.

Neither the board nor its individual members can be responsible for the placing of applicants for training. The board will give no independent approval and will keep no independent list of approved residencies or preceptorships. The board will consider those residencies approved by the Council on Medical Education and Hospitals of the American Medical Association as acceptable facilities for training in plastic surgery.

It should be kept in mind by all that the primary interest of the board is to encourage well rounded training in plastic surgery with the aim of producing plastic surgeons capable of doing good work in the wide variety of cases which may come under their care. The standards set up by the board, both for preliminary general surgery and for specialized plastic surgery training, are established in an effort to further this aim. The quality of the training received should be reflected in the candidate's ability to achieve good results in his practice and the examinations of the board are an attempt to judge the ability of the candidate in the specialty of plastic surgery.

SUGGESTIONS FOR TRAINING IN PLASTIC SURGERY

A residency in plastic surgery is one in which a hospital appointment for training in plastic surgery is given the trainee. In a preceptorship in plastic surgery no such appointment is given.

While the board permits flexibility in training, approved residencies and preceptorships should be under fully qualified plastic surgeons. Those trained in preceptorships will be judged by the candidate's ability to make the most of his training and to show adequate ability in all phases of the subject.

There must be teaching in either a residency or a preceptorship—instruction in the basic sciences and in the basic principles of plastic surgery—if not in actual courses, then by conferences, ward rounds, lectures by men on the service or other services, or by visiting doctors.

A resident or assistant resident in plastic surgery should have a full time appointment from an A.M.A. Council-approved hospital or hospitals. A preceptee does not have such an appointment. A residency should preferably be in connection with a teaching hospital having medical school affiliations or be under the Dean's Committee of Veteran's Administration hospitals. An acceptable residency is one that is approved by the Council on Medical Education and Hospitals of the American Medical Association.

Before training in plastic surgery is begun, the plastic surgeon in charge of the residency or preceptorship should ascertain that the trainee's preliminary training in general surgery meets the requirements of the board, that is two years of residency training in general surgery after the internship year.

The training in plastic surgery (at least two years) whether in a residency or a preceptorship, should cover a wide field of plastic surgery, both as to type and anatomical distribution. There should be available sufficient material of a diversified nature so that the trainee will be able to pass the examinations of the board after the period of training and the two additional years of private practice. If the available material on one service is inadequate, the defiiciency should be made up by affiliation with another plastic surgeon on another service so that a broad experience will be obtained in plastic surgery. The trainee should be provided an opportunity to operate under the direct supervision of the plastic surgeon in charge, and with increasing ability, to be given an opportunity to operate independently on suitable cases under more remote supervision.

It would be well for a preceptor to report annually to the board the name and qualifications of any preceptee under his supervision, as well as the work done by the preceptee. The preceptee should report to the board every six months the number and type of operations performed both under supervision and independently, giving details of supplementary activities of his training.

MILITARY CREDIT

Credit for military service is given on an individual basis, each case being considered on its own merits and the amount of credit allowed being determined by the board when the information is submitted with the application.

CASE REPORTS

On approval by the board of a candidate's application for certification, each candidate is required to submit to the board thirty-five or more case reports illustrative of his independent work in the field of general plastic surgery. These case reports shall conform to conditions which the board may from time to time specify and the case reports must be approved by the board before the candidate is admitted to examination.

The thirty-five case reports must be of a diversified nature and must be submitted to the office of the board, together with photographs. The group must include a variety of material from the entire body rather than a number of cases of one type, and should carry the candidate's personal deductions, conclusions and comments and should be sufficiently detailed to show if the conclusions drawn indicate a grasp of the subject and if the results justify the procedure.

Each case report should be typewritten on paper approximately 8½ x 11, separately numbered and paged, with the candidate's name on each page. Each report should be individually assembled and held by removable fasteners and should have a cover sheet with the candidate's name, the number of the case, hospital number, diagnosis and a brief summary of the case (not over 100 lines). The case reports, photographs and other data are to be filed with the permanent records of the board.

Cases should be chosen from the private practice of the candidate or from the hospital or clinic service. The initials, color, age and occupation of each patient should be stated, as should the name of the hospital where treated and dates of admission, operation and discharge. The important details of family history, if relevant, and of the previous history should be given. The history of the condition for which the patient consulted candidate should be stated clearly and concisely, indicating previous treatment, if any, and the mental, social or economic factors involved. The physical examination of the patient with special reference to the existing deformities should be carefully described. All laboratory and other special examinations, such as roentgenograms, which were made, should be reported, with a statement of what was determined by them. The indications for operation and for the type of operation employed should be given, and the preliminary treatment and the type of anesthesia used should be stated. A full description of the operative technic with methods of hemostasis, suture and drainage, if any, and the name of the assistant should be given. The late and early postoperative course and results should be

described. Photographs of conditions and drawings of operative technic, illustrative of each case should be included and securely attached to each case report, with the name of the candidate and the number of the case indicated. Before and after photographs should be shown, and all photographs should be made by a sharp focus lens from untouched negatives with identical lighting conditions, exposure and developing, and should show conditions before and after operation with clear detail.

If the case reports, and lists of operation when requested, are approved, the candidate will receive subsequent information regarding taking the examinations. The board at its discretion may request certification of case reports by the hospital where the operations were performed. The following form should accompany the case reports: "I hereby certify that the planning and essential surgical procedures described herein were carried out by me as an independent operator."

A candidate should remember that these case reports are documentary evidence of his ability and that the material in them and the manner of presentation are important evidences of his ability.

EXAMINATIONS

The qualifying examinations are divided into two parts, the written examination, and the oral and practical examinations.

The examinations are given twice yearly, in the spring and fall. The spring examination is given immediately preceding, during or following the annual meeting of the American Association of Plastic Surgeons (usually in May), and the fall examination is given immediately preceding, during, or following the annual meeting of the American Society of Plastic and Reconstructive Surgery (usually in October). Candidates are required to go to the designated center for the qualifying examination, which lasts three days. These centers will be the city in which the meetings of these two organizations are held if the proper clinic and hospital facilities are available, otherwise in some nearby city where such material is available. Arrangements for all examinations are made by the Examination Committee.

The written examination will consume all of the first day and half of the second day. The oral and practical examination will consume the afternoon of the second day and all of the third day. The subjects of the written examination are: (1) theory and practice of plastic surgery; (2) applied anatomy, applied physiology; (3) pathology, bacteriology, clinical laboratory methods, pharmacology; (4) reaction of tissue to injury, surgical accidents, anesthesia.

A general oral examination pertaining to plastic surgery will be given. In the practical part of the examination, the examiners will present a group of patients for examination by the candidates, and the candidates will be quizzed on methods of procedure—diagnosis, treatment, technic, and so on. Slides of preoperative conditions will be shown on a screen and the candidate asked to make a quick diagnosis of the items and tabulate in the order of their importance and methods of treatment. Microscopic slides of the average pathological tissue falling within the province of the plastic surgeon will be given the candidates on which they will be asked to write a description and diagnosis.

Either prior to or following the examination, the candidate will be visited at his place of practice by a member or members of the board to observe him operate and to examine a number of his pre- and postoperative cases.

To be considered as passing, the candidate will be required to receive a grade of at least 65 per cent in each portion of the written examination and an average of 75 per cent on the entire written and oral examination.

REEXAMINATIONS

Candidates who have failed in any portion of the examination may be admitted to another examination after one year, or within three years, except in such cases as the board may for good and sufficient reason deny a candidate the privilege of reexamination. The candidate must give sixty days' notice requesting a reexamination and pay a fee of $25.00 for the written reexamination and $25.00 for the oral and practical examination. The examiners conducting the first examination will not be eligible to conduct the reexamination.

FEES

The fee for application and examination is $150. Of this sum, $25 must accompany the application and the remaining $125 must be paid when the candidate is notified of acceptance for examination. There will be no refunds. This fee may be increased at the discretion of the board. The board is a nonprofit organization and the fees of candidates are used solely for defraying the actual expenses of the board. The members of the board serve without remuneration. Because of the limited number of surgeons certified by this board it is necessary for a while to request a voluntary annual prorata contribution from diplomates after the first year's certification to defray expenses of the board.

CERTIFICATION

After a candidate has met the requirements for eligibility and passed the examinations of the board, a certificate attesting his qualifications in plastic surgery will be issued to him by the board, signed by its officers, and having the seal of the board affixed thereto. It shall be the prerogative of the board to determine the fitness professionally and ethically of any candidate for its certificate, and the action or decision of the board regarding the certification of any candidate shall be final.

The board is in no sense an educational institution and the certificates of the board are not to be considered as degrees. Therefore the certificate does not confer on any person legal qualifications, privileges, or license to practice medicine or the specialty of plastic surgery. The board does not purport in any way to interfere with or limit the professional activities of any licensed physician nor does it desire to interfere with any practitioners of medicine in any of their regular or legitimate activities.

The American Board of Plastic Surgery has never been concerned with measures that might gain special privileges or recognition for its certificants in the practice of plastic surgery. It is neither the intent nor has it been the purpose of the board to define requirements for membership on the staffs of hospitals. The prime object of the board is to pass judgment on the education and training of broadly competent and responsible plastic surgeons—not who shall or shall not perform plastic surgical operations. The board specifically disclaims interest in or recognition of differential emoluments that may be based on certification.

AMERICAN BOARD OF PREVENTIVE MEDICINE AND PUBLIC HEALTH

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GENERAL QUALIFICATIONS

1. Moral and ethical standing in the profession satisfactory to the board.

2. Graduation from a medical school in the United States or Canada approved by the Council on Medical Education and

Hospitals of the American Medical Association, or from a foreign medical school satisfactory to the board.

3. An internship of at least one year in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association or in a foreign hospital satisfactory to the board.

4. Licensure to practice medicine in the United States or the Dominion of Canada.

5. Special training in preventive medicine or public health which shall include:

(*a*) A period after internship of not less than six years of special training, teaching or practice in preventive medicine and public health which must include (*b*) and (*c*).

(*b*) Successful completion of at least one academic year of graduate study leading to the degree of Master of Public Health or an equivalent degree or diploma or an equivalent satisfactory to the board.

(*c*) Field training or residency of at least two years of field experience in general public health practice which included planned instruction, observation and active participation in a comprehensive, organized public health program, one year of which may be an approved clinical residency in a field directly related to public health.

6. Limitation of practice to teaching or practice of preventive medicine or public health as a specialty.

THE FOUNDER'S GROUP

The by-laws authorize the board for a limited period of time to excuse from examination practitioners of preventive medicine or public health who have attained unquestioned eminence in the field. This has been so defined as to include professors and associate professors of preventive medicine or public health in medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association or in schools of public health accredited by the American Public Health Association, or individuals who have been or are president of one of the sponsoring societies designated in the certificate of incorporation, or have had at least ten years of distinguished service in the field of public health and are considered eligible by the board. Applicants for consideration as members of the Founder's Group must be received by July 1, 1950.

EXAMINATIONS

Examinations will be held from time to time and in various places depending on the need as indicated by applications received. It is expected that examinations will be held primarily in connection with the meetings of the American Public Health Association. The examination will consists of two parts:

Part one to consist of a comprehensive written examination designed to test the knowledge of the applicant in the general field of preventive medicine and public health. These examinations will be announced at least sixty days prior to the holding of the examinations. The written examination will be confined to one day.

Part two to consist of the oral or practical examination which will be held on the day following the written examination. This examination will be held before two to four examiners, members of the board or associate examiners. An endeavor will be made to adapt the details of the oral examination to each candidate's experience and practice. The examiners will report orally on each candidate to the assembled board, after which the results of the examination will be considered jointly by the entire board and the examiners. Final action of the board will be based on the candidate's ethical and professional record, training and attainments as well as on the results of his formal examination.

APPLICATIONS

Each application for examination for certification shall be in writing signed by the applicant and shall be filed with the secretary not less than ninety days prior to the date of the examination. Application must be on prescribed application forms. The application must be accompanied by an application fee and two recent, clear, unmounted, autographed photographs of the applicant, and by at least two letters from physicians duly licensed by law to practice medicine, stating in substance that in the opinion of the writer of such letter the applicant is eligible under the provisions set up by the board.

FEES

The board is incorporated as a nonprofit corporation and no member of the board may receive any compensation. Minimum fees are specified, consistent with the cost of examination and certification. The total cost to the applicant is $50.00.

Application fee, $15.00. No application can be considered for classification and action by the eligibility committee unless accompanied by the application fee. The application fee is not refundable.

Certification fee, $35.00. This fee is payable when the candidate is notified of acceptance for examination or as a member of the Founder's Group. It is not returnable after the candidate has been officially accepted and notified by the eligibility committee to report for examination. All applications must be on the standard form and accompanied by the necessary documentation. No member of the board is authorized to give informal opinions as to the eligibility of the candidates. The determination of eligibility will be made only by the eligibility committee after receiving full application information. All candidates must comply with board regulations in effect for the year in which the examination is taken, regardless of when the original application was filed. Applicants declared ineligible for admission to examination may reopen their applications within two years of the filing date without payment of an additional application fee. Applicants declared eligible but who fail to exercise the examination privilege within three years of the filing of the application are required to file a new application and to pay a new application fee.

CERTIFICATION

On satisfactory completion of the examinations or in the case of the Founder's Group, on the affirmative vote of the board, a certificate will be issued to the effect that the person named has been found to be possessed of the special knowledge in preventive medicine and public health. This certificate will be signed by the officers of the board and shall have its seal affixed. Each certificate shall remain the property of the corporation, but each person to whom a certificate is issued shall be entitled to its possession until revoked. Any certificate issued by the board may be revoked if evidence, satisfactory to the board, is presented that the applicant was not eligible at the time of application, or made any misstatement or misrepresentation of facts or that his license to practice medicine has been suspended or revoked.

AMERICAN BOARD OF PROCTOLOGY

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R. A. SCARBOROUGH, San Francisco.
LOUIS A. BUIE, Secretary-General, 102-110 Second Ave., S.W., Rochester, Minn.

TYPES OF CERTIFICATION

An application for certification is a voluntary act. Two types of certification will be offered until Jan. 1, 1955. Certificates will be issued (1) to those who fulfil requirements for certification as specialists in the diagnosis and treatment of anorectal diseases exclusive of those conditions which require surgical operation within the abdomen and those which require radical operation for malignant diseases of the rectum, and (2) to those who fulfil requirements for certification as specialists

in the diagnosis and treatment of anorectal and colonic diseases. It is important to repeat that the essential difference between the two types of certification is that diplomates of the first type will no be certified to administer treatment which requires surgical operation within the abdominal cavity nor to perform radical operations for malignant diseases of the rectum, while diplomates of the second type will be certified to administer such treatment or perform such operations. After Dec. 31, 1954, the first type of certification will be discontinued.

QUALIFICATIONS

This board does not intend to interfere with any practitioner of medicine in his legitimate activities but wishes only to certify, in so far as possible, to the public that physiciains who claim to be specialists in proctology possess proper qualifications. Suitable evidence of such qualifications can be obtained only if a physician can satisfy this board concerning his training and can thereafter pass examinations required for certification.

Article VIII of the by-laws of the American Board of Proctology, which follows, is quoted verbatim, in order that there will be no doubt in the minds of applicants whether their qualifications meet the standards of the board.

ARTICLE VIII. APPLICATION FOR CERTIFICATES

Section 1. Each application for a certificate shall be filed with the secretary-general on the prescribed form and shall be accompanied by the designated fee. It shall also be accompanied by an unmounted autographed recent photograph of the applicant and by names of two proctologists acceptable to, but not members of the board, who may be referred to for information in regard to the applicant.

Section 2. General qualifications which the applicant must possess:

(a) High ethical and professional standing.

(b) Authorization to practice medicine in the country, state, territory or province of his residence.

(c) Membership in the American Medical Association or the corresponding medical association of the country in which he resides.

(d) One year of internship in a hospital acceptable to the Council on Medical Education and Hospitals of the American Medical Association, following completion of a four year course in a Class A medical school.

Section 3. Special qualifications for applicants who desire certification in anorectal surgery only (this type of certification does not include operations in the abdominal cavity or radical surgical operations for malignant disease of the rectum and will be discontinued after Dec. 31, 1954):

(a) A period of three years' graduate training, after internship, in clinics, dispensaries, hospitals or laboratories approved by the Council on Medical Education and Hospitals of the American Medical Association and the American Board of Proctology as competent to provide satisfactory training in proctology and the principles of general surgery. This specialized training shall include graduate training in the basic sciences according to the standards prescribed by the Council on Medical Education and Hospitals of the American Medical Association and by this board. In individual instances credit may be granted for work done in preceptorships approved by this board and also for military service.

(b) An additional period of not less than two years of training or practice limited to proctology.

(c) Evaluation of examinations which shall include the basic medical sciences and the clinical, laboratory and public health aspects of proctology.

Section 4. Special qualifications for applicants who desire certification in both anorectal and colonic surgery:

(a) A period of five years' graduate training after one year of internship. Three years of this period shall have been spent in training in general surgery and the basic sciences in clinics, dispensaries, hospitals and laboratories approved by the Council on Medical Education and Hospitals of the American Medical Association and the American Board of Proctology. Two years' additional training as a full time resident in proctology shall be acquired by the applicant in proctology. In individual instances, credit may be granted for work done in general surgery or proctology in preceptorships approved by this board, and also for military service.

(b) This training shall be evaluated further by examination which shall include the basic medical sciences as well as the clinical, laboratory and public health aspects of abdominal, intestinal, rectal and anal surgery.

Section 5. Those applicants who have been graduated from a Class A medical school for more than ten years and who wish certification in anorectal surgery only shall be required to submit to the American Board of Proctology satisfactory evidence of training and experience in proctology, together with evidence of superior achievement in the ethical practice of this specialty. They shall furthermore be required to pass suitable examinations in the subject and to submit, if thought advisable by the board, hospital case reports or demonstrate their competency to representatives of the board. This method of certification shall terminate Sept. 3, 1951.

MILITARY CREDIT

Physicians who were on active duty in the armed forces for one year or more and who entered the service prior to Aug. 15, 1945, will be given one year of credit. The board may allot additional credit if the candidate furnishes evidence of suitable surgical service under acceptable supervision. No credit in excess of two years will be allowed.

APPLICANTS TRAINED IN FOREIGN COUNTRIES

Applicants must hold a license to practice medicine or surgery in the country in which they reside or hold citizenship, and they must have fulfilled all other requirements.

GENERAL REQUIREMENTS

1. All candidates shall comply with current regulations of the board regardless of the time of filing applications. The secretary is not permitted to make decisions as to requirements. These rulings are made by the Committee on Standards and Requirements or by the board after reviewing the candidates' formal applications.

2. All candidates shall have limited their practice to proctology.

3. Application forms shall be filled out completely and accurately. It is to the advantage of the applicant to supply letters of endorsement.

4. A fee shall be remitted in the following manner: Twenty-five dollars with the application blank and when the candidate is notified that he is acceptable for examination, he shall remit the examination fee, which is $150 for candidates in proctology and $100 for candidates in anorectal surgery.

5. All candidates shall appear personally before the board.

6. All candidates shall submit to the required examinations.

7. Applicants may be requested to deliver to the board a record of all patients hospitalized during the year prior to the date of submission of his application. Each record shall be endorsed by an appropriate official of the hospital and must include dates of admission and discharge from the hospital, the diagnosis, treatment and result.

8. Candidates shall submit a bibliography of papers and books published.

EXAMINATIONS

Part I shall consist of written and oral examinations covering the theory and practice of proctologic surgery, applied anatomy and physiology, pathology, bacteriology, clinical laboratory methods, and allied subjects.

Part II shall consist of a clinical examination including (1) examination of patients, (2) gross and microscopic pathology and (3) roentgenologic interpretation.

The examinations will be held at times and places which will be determined by the board and will be announced in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. All applications must reach the office of the secretary-general at least sixty days prior to the time set for the examination and all candidates who are eligible will be notified at an appropriate time.

GRADES AND REEXAMINATIONS

An average of 75 per cent is the minimum grade which will be acceptable to the board for certification of a candidate.

If a candidate should fail in Part I, he will be required to wait one year before he may be reexamined.

If a candidate should pass Part I and fail Part II, he must wait a year before being allowed a reexamination in Part II.

If a candidate should fail the reexaminaion in Part I or Part II, he will be required to submit a petition to the board. With such a petition, the candidate must submit satisfactory evidence of further substantial preparation. The board may approve of another reexamination or it may deny such privilige.

A fee of $50 will be charged for the second reexamination in Part I or Part II.

CERTIFICATION

A certificate which attests to the candidate's qualifications will be awarded to those who have met the requirements for eligibility and have passed the examinations with a grade of 75 per cent or better.

Each diplomate shall be required to pay a fee of $10 annually to the board for a period of ten years following the year of his certification.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY

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FRANCIS J. BRACELAND, Secretary-Treasurer, 102-110 Second Avenue, S. W., Rochester, Minn.
DAVID A. BOYD JR., Associate Secretary, Rochester, Minn.

APPLICATION FOR CERTIFICATES

An application, in order to be considered at any meeting of the board, must be in the hands of the secretary of the board not less than ninety days before the date of such meeting. A proper application form may be obtained from the secretary. Application may be made for certification in psychiatry or in neurology or in both fields. Applications will be formally considered only when made on the official application blank in such form as may be adopted from time to time by the board and when accompanied by an application fee in such amount as may be fixed by the board.

The secretary of the board, on receipt of an application, shall forthwith make inquiries from those to whom the candidate refers and from such other persons as the secretary may deem desirable and shall verify the candidate's record from the biographical records of the American Medical Association, after which he shall forward the application to the Committee on Credentials. This committee shall consider the application and other information available and notify the secretary whether the application is accepted. The certification of a candidate in either psychiatry or neurology, or both, shall be approved by a majority of the members of the entire board at a meeting held for such certification.

FORM OF CERTIFICATION

There shall be separate certification in psychiatry and in neurology and two certifications or a combined certification for those qualified in both fields. The certifications shall be in such form as is approved by the Board of Directors.

GENERAL REQUIREMENTS FOR APPLICANTS

Each applicant for a certificate must establish that:

(*a*) He is a physician duly licensed by law to practice medicine.

(*b*) He is of acceptable ethical and professional standing.

(*c*) He is now a member of the American Medical Association or a member of such medical societies as are recognized for purposes of certification by the Council on Medical Education and Hospitals of the American Medical Association. Exceptions to the foregoing may be made at the discretion of the board for good and sufficient reasons.

(*d*) He has received adequate training in psychiatry or neurology, or both, as a specialty.

CLASSES OF APPLICANTS

Class A.—Applicants who graduate from an approved medical school before the foundation of the board (1934) will not be held to the strict interpretation of the published requirements in formal graduate training. Under such circumstances the board will consider the training and experience of the applicant and decide whether or not he will be admitted to the examination.

Class B.—Applicants who graduated from an approved medical school after 1934 shall fulfil the following requirements.

PROFESSIONAL EDUCATION

1. Graduation from a medical school in the United States or Canada approved by the Council on Medical Education and Hospitals of the American Medical Association. In the case of an applicant whose training has been received outside the United States and Canada, such training must be satisfactory to the aforementioned Council.

2. Completion of a year's internship approved by the same Council in general medicine, general surgery, pediatrics or a rotating internship.

3. The nine month wartime internships will be accepted as an equivalent of one year.

SPECIALIZED TRAINING

Admission to the examination for certification in psychiatry or neurology requires a total of five calendar years of training and experience, three years of which must be specialized training obtained in approved training centers, plus two years of experience. Admission to the examination for certification in both psychiatry and neurology requires a total of six calendar years of training and experience, five years of which must be specialized training obtained in approved training centers, plus one year of experience. The specialized training may be subdivided into two and one-half years each in psychiatry and neurology or three years in one subject and two years in the other. The required years of experience should be spent in clinical practice with major responsibility for the care of patients.

This training for psychiatrists should include clinical work with psychoneurotic and psychotic patients, combined with the study of basic psychiatric sciences, medical and social psychology, psychopathology, psychotherapy and the physiological therapies, including a basic knowledge of the form, function and pertinent pathology of the nervous system. This training should be supervised and guided by teachers competent to develop skill and understanding in the utilization of such basic knowledge in dealing with patients. Mere factual knowledge is not sufficient. This training period should include instruction in the psychiatric aspects of general medical and surgical conditions and the behavior disorders of children and adolescents sufficient to develop practical ability to direct the treatment of such conditions. It should also include collaborative work with social workers, clinical psychologists, courts and other social agencies. The training program of the candidate for certification in psychiatry should include sufficient training

in neurology to enable him to recognize and to evaluate the evidences of organic neurological disease.

The training for neurologists should be based on clinical work with adults and children with neurological disorders, including the neurological complications of medical and surgical conditions. This shall be combined with study of basic neurological sciences, neuroanatomy, neurophysiology, neuropathology and neuroroentgenology. This training should be supervised and guided by teachers competent to develop skill and understanding in the utilization of such basic knowledge in dealing with patients. Mere factual knowledge is not sufficient. This training should include sufficient training in psychiatry to enable the candidate to recognize and to evaluate the common psychiatric reactions.

The board offers the foregoing two paragraphs as an outline of desirable training. If, however, the candidate has evidence of equivalent qualifications of training and experience not in the pattern here formulated, this experience with appropriate documentary support may be included in his application for evaluation and possible approval by the board.

Candidates seeking certification in both neurology and psychiatry or supplementary certification in one after being certified in the other must submit evidence satisfactory to the board of an additional two years of full time basic training in the supplementary specialty.

Thus, no candidate is eligible for examination by the board until he has completed at least five years of special training and experience in neurology or psychiatry for a single certificate, or at least six years of special training and experience in neurology and psychiatry for certification in both neurology and psychiatry.

The board will give not more than six months of credit for not less than six months of training in an approved training center for internal medicine or pediatrics in lieu of six months of experience to candidates for the certificate in psychiatry or neurology, but not to candidates for certification in both psychiatry and neurology.

The board will give credit for one year of training in child psychiatry provided it is the third year of the required three years of special training required by the board and providing it is taken in a center approved by this board for training in child psychiatry.

The lists of training programs approved by this board and by the Council on Medical Education and Hospitals of the American Medical Association may be found in the current issue of the Educational and Internship and Residency numbers of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

The secretary may at his discretion admit to examination candidates who lack not more than two months of the time requirement for certification with the understanding that the certificate will in no case be issued until satisfactory written evidence of completion of this requirement is submitted to the board.

TRAINING IN THE ARMED FORCES

Credit will be granted for one year of wartime military service in the Army, Navy, Public Health Service and Veterans Administration. Wartime to this board means Dec. 7, 1941 to Feb. 15, 1946. Further credit for specialized training will be granted only if the candidate has received training in an institution recognized by the Council on Medical Education and Hospitals of the American Medical Association and approved by this board. Time beyond one year spent in the above government agencies may be credited to experience providing the candidate has been regularly assigned to a service in neurology or psychiatry.

EXAMINATIONS

Date and places of examinations are set by the board at its discretion and shall be announced in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, in the *American Journal of Psychiatry*, in the *Journal of Nervous and Mental Diseases*, and in the *Archives of Neurology and Psychiatry*.

The examinations are designed to test the competence of the candidates. The board requires some proficiency in neurology on the part of those it certifies in psychiatry, and vice versa, but examines the candidate in accordance with the certificate he seeks. The examinations will be of such type that no adequately trained person will fail and yet they will be sufficiently searching so that the specialist in fact may be separated from the specialist in name. The practical examination will include the examination of patients under the supervision of the examiner. The manner of examining patients, and the reasoning and deductions therefrom, will constitute an important part of the examination. Oral and practical examinations will be given in the basic sciences with special regard to their clinical implications. Written examinations may be given at the discretion of the board. The examination for certification in psychiatry will differ from the examination for certification in neurology.

PAYMENT OF FEES

The candidate on filing his application shall accompany it with an application fee of $25 which is not returnable. If a preliminary written examination has been decreed, an additional $25 fee will be required at the time of the applicant's acceptance. When notified by the secretary that he is eligible for the oral and practical examination, the candidate shall send to the secretary an examination fee of $50. A candidate who has been certified in either psychiatry or neurology and who has been admitted to supplementary examination for the other certificate shall pay an additional examination fee of $50.

A candidate who has failed in one examination is eligible for reexamination within one year on payment of a reexamination fee of $25. After the year has elapsed he must submit a new application and pay new application and examination fees. If he fails the reexamination, he may, after two years have elapsed, submit a new application and $25 fee, present evidence of further training and pay an examination fee of $50.

A candidate who fails in one or two subjects is eligible for reexamination in those subjects within one year on payment of a reexamination fee of $25. After the year has elapsed he must submit a new application and pay new application and examination fees and repeat the entire examination. If he fails the reexamination, he may apply again for the complete examination after two years on submission of evidence of further training and on payment of an application fee of $25. If admitted to the examination, he must pay a new examination fee of $50.

Any candidate who finds himself unable to attend an examination to which he has been admitted and does not notify the secretary at least six weeks before the date of the examination will forfeit half of his examination fee. Any candidate who fails to appear for examination within a period of three years following the date of notification of eligibility for examination shall be required to submit a new application and pay the attendant fee. If a candidate dies before his certificate is issued, all fees will be returned to his estate.

AMERICAN BOARD OF RADIOLOGY

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B. R. KIRKLIN, Secretary-Treasurer, 102-110 Second Avenue, S.W., Rochester, Minn.

CERTIFICATES

A certificate will be issued to each candidate who meets the requirements of the board, to the effect that the holder of the certificate has had adequate training in radiology and has successfully fulfilled the requirements of the board.

A certificate granted by this board does not of itself confer, or purport to confer, any degree, or legal qualifications, privileges or license to practice radiology. Certificates of the board shall be issued on one of two forms:

1. A certificate to the effect that the applicant has been found qualified to practice radiology in all its branches.

2. A certificate to the effect that the applicant has been found qualified to practice radiology in one or more of the following special fields: (*a*) roentgenology; (*b*) diagnostic roentgenology; (*c*) therapeutic radiology.

DEFINITIONS

For the purposes of this board, the following definitions are adopted:

1. Radiology is that branch of medicine which deals with the diagnostic and therapeutic application of radiant energy including roentgen rays and radium.

2. Roentgenology is that branch of radiology which deals with diagnostic and therapeutic application of roentgen rays.

3. Diagnostic roentgenology is that branch of radiology which deals with the diagnostic application of roentgen rays.

4. Therapeutic radiology is that branch of radiology which deals with the therapeutic application of roentgen rays, radium and radioactive isotopes.

GENERAL REQUIREMENTS

Each applicant for admission to the examination shall be required to present evidence that he has met the following standards:

General Qualifications

1. Satisfactory moral and ethical standing in the profession.

2. A license to practice medicine in the state or county in which he resides.

3. Membership in the American Medical Association, or membership in such Canadian or other medical societies as are recognized for this purpose by the Council on Medical Education and Hospitals of the American Medical Association. Except as herein provided, membership in other societies shall not be required.

4. That the applicant holds himself out to be a specialist in radiology or one of its branches as defined under "definitions," and that he devotes his time primarily and principally (at least 75 per cent) to the practice of radiology or one of its branches.

5. That he is a citizen of the United States or Canada. Candidates from other countries must be permanent residents of that country and native citizens thereof.

General Professional Education

1. Graduation from a medical school recognized by the Council on Medical Education and Hospitals of the American Medical Association. If the applicant is a resident of the United States or one of its possessions and is a graduate of a medical school outside the United States or Canada, he must have a certificate of the National Board of Medical Examiners.

2. Completion of an internship of not less than one year in a hospital approved by the same Council.

Special Training

1. After completion of the internship there shall be a period of special training in radiology of not less than three years in clinics, hospitals or dispensaries recognized and approved by the American Board of Radiology and the Council on Medical Education and Hospitals of the American Medical Association as competent to provide a satisfactory training in radiology. This period of specialized training shall include:

(*a*) Graduate training in pathology, radiation physics and radiobiology. A period of six months full time training in pathologic anatomy is recommended but where this is not possible to arrange, the student during his three year training period may, by attending pathologic conferences, postmortem examinations and studying removed tissues, receive adequate training in pathology. It is recommended that radiation physics be taught by a combination of didactic lectures, practical examples and direct clinical demonstrations.

(*b*) An active experience (residency) of not less than twenty-four months in an institution, the radiologic department of which is recognized and approved by the American Board of Radiology and the Council on Medical Education and Hospitals of the American Medical Association as capable of providing satisfactory training.

(*c*) Examination in the basic sciences of radiology as well as the clinical aspects thereof. These examinations should be given by the student's instructors in order to allow those responsible for his training to certify to the board that he is adequately prepared.

APPLICATION

The board desires to appraise the candidate's educational opportunities (premedical, medical and radiologic), the ability of his instructors, his hospital and teaching positions, his original investigations, his contributions to radiologic literature, his membership in medical societies and his local and general reputation.

For this purpose, application must be made on a special blank which may be obtained from the secretary. No application will be considered unless made on the regular application blank. This application shall be forwarded with the required data, two unmounted photographs and the fee of $75 at least two months before the date of the examination.

FEE

A fee of $75 must accompany each application blank. This fee will not be returned, and no application will be considered until the fee is received. This fee has been carefully computed and is used entirely for administrative purposes. Members of the board and special examiners do not receive any compensation except for actual expenses connected with holding the examinations. As the number of candidates decreases, it may become necessary to raise the fee.

EXAMINATIONS

Each year the board will hold an examination in conjunction with the annual meeting of the American Medical Association, and, when sufficient applications are on file, a second examination will be held in conjunction with the annual meeting of the American Roentgen Ray Society and/or the Radiological Society of North America.

For the present, examinations consist of practical and oral examinations, although written examinations may be added later. The examinations are designed to test the candidate's fitness to practice radiology or one of its branches as a specialty. The board will endeavor to adapt this examination to the candidate's experience and years of practice. It will try especially to ascertain the breadth of his clinical experience, his knowledge of the basic sciences of radiology, and likewise his knowledge of the recent literature on radiology, and his general qualifications as a specialist in this branch of medicine.

The examination consists of tests in film interpretation and an oral examination in pathology, physiology, radiophysics and radiobiology, as well as the clinical applications of roentgen rays, radium and radioactive isotopes. The applicant is also examined in "professional adaptability," in an attempt to ascertain his attitude toward his fellow practitioners and his patients.

Whenever an applicant fails to pass the examination, the board, if requested, will make suggestions as to suitable courses of instruction for the purpose of overcoming his deficiencies.

REEXAMINATIONS

If the candidate fails in the first examination he will be admitted to a second examination after one year has elapsed but not more than three years. He must give ninety days'

notice of his intention to appear for reexamination and pay an additional fee of $35. If a candidate who has failed does not appear for reexamination before the expiration of three years, he will be required to make a new application and pay an additional fee of $75.

A candidate having failed twice may, after one year has elapsed, file a new application which must be accompanied by the fee of $75.

AMERICAN BOARD OF SURGERY

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CALVIN M. SMYTH, Philadelphia.
J. STEWART RODMAN, Secretary-Treasurer, 225 S. Fifteenth Street, Philadelphia.

GENERAL QUALIFICATIONS

1. Moral and ethical standing in the profession satisfactory to the board.

The board, believing that the practice of "fee splitting" is pernicious, leading as it does to a traffic in human life, will reserve the right to inquire particularly into any candidate's practice in regard to this question.

2. Those whose activities are limited to the practice of surgery. This includes diagnosis, preoperative and postoperative care. It does not include obstetrics without surgical complications, or the general practice of medicine.

PROFESSIONAL STANDING

1. Graduation from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from a foreign school considered acceptable by the board.

2. Completion of an internship (straight or rotating) of not less than one year in a hospital approved by the same Council, or its equivalent in the opinion of the board, such as a year of study devoted to a single branch of medicine.

SPECIAL TRAINING

The educational requirements listed became effective for all candidates after July 1, 1950. The board considers the requirements outlined to be minimal in attaining its purpose, and encourages candidates to take advantage of broadening experience in other fields.

Group I. In addition to one year of internship or its equivalent, a candidate must have a minimum of four years of training in surgery in an institution or institutions acceptable to the board. Three of these years must be spent in an approved residency or clinical fellowship. One year may be spent in a surgical specialty, or experimental surgery or research, or work of such a character that the relation of the basic sciences of anatomy, physiology, pathology, bacteriology, biophysics and biochemistry to surgery is emphasized. If the second year of a two year internship is surgical and is an integral part of a four year graded training program, it will be acceptable to the board.

During these four years of training a candidate must:

1. Hold positions of increasing responsibility for the care and management of patients with surgical conditions.

2. Have sufficient operative experience to acquire surgical skill and judgment through the performance of surgical operations with a high degree of responsibility but under circumstances providing adequate opportunity for consultation and advice.

Group II. The board realizes that there is not as yet an adequate number of four-year graded residencies (Group I) to meet the needs of the country for qualified surgeons. Therefore, the board will continue to recognize three years[1] of residency training in an instution or institutions acceptable to the board, followed by two years of study or practice of surgery, during which time sufficient operative experience to meet the board's requirements must be obtained. The latter two years must be taken under the supervision of a surgeon certified by or acceptable to the board, and carrying on his practice in hospitals approved as meeting the minimum hospital requirements of the American College of Surgeons. Not more than two of the five years required by Group II applicants may be spent in the subspecialties of surgery.

BASIC SCIENCES

The board does not insist that any special length of time be spent in the basic sciences, but knowledge of these sciences as applied to clinical surgery will be required in the examination. In both groups I and II, as much as one year's credit, however, will be given to recognized graduate school courses in these basic sciences if such courses are an integral part of an acceptable university medical school, but only in group II is this applicable to the three years of residency required. The board will not, however, give credit for any post-graduate course of less than six months' duration.

At the completion of training, the board will request responsible representatives of the institutions in which the candidate has had the major portion of his training to attest to his character and professional competency, and to recommend that he be admitted to its examinations. This requirement is applicable to candidates in both groups.

Approval will be given for experience obtained in institutions having training programs of less than three years only when such a program is affiliated with and forms an integral part of an approved graded residency.

MILITARY CREDIT

Candidates who were on active duty in the armed forces for one to two years and who entered these services prior to V-J Day (Aug. 15, 1945) will be given one year military credit. Subsequent to Feb. 15, 1946, credit for military service will be given on the same basis as in civilian training as described elsewhere. Credit for military service may be applied to the residency requirement as outlined for Group II candidates, but military credit is not allowed for Group I candidates.

REQUIREMENTS FOR FOREIGN BORN AND FOREIGN TRAINED APPLICANTS

Full citizenship status is required of residents of the United States. United States citizens who are residents of other countries, and citizens of other countries must have completed at least the three year residency training requirements in a hospital in the United States. In addition, they are required to hold a license to practice surgery in the country in which they are resident or hold citizenship.

APPLICATIONS

Prospective candidates considering themselves eligible for examination should submit a letter to the board's office outlining briefly, in concise and chronological order, their qualified training since graduation from medical school. If the prospective candidate's letter appears to meet the minimum requirements, an application form will be mailed to the candidate for completion. The processing of the completed application by the board's office and the Examination Committee requires a minimum of three months. The candidate will then be notified by the secretary as to his acceptability for examination, his deferment or ineligibility.

The eligibility of candidates whose training in some respects does not conform to requirements published above will require the action of the Examination Committee, which may postpone the candidate's notification of acceptability. Every candidate's

1. When a candidate receives his training in more than one institution, it is imperative that he hold positions of increasing responsibility.

final acceptability for examinaiton is based not only on the evaluation of his training qualifications, but on recommendation by the board's advisors as to his professional ability as a surgeon, his ethical standing in the community and the strict limitation of his work to surgery.

THE FOUNDERS GROUP

The Founders Group, to which were admitted those who had already amply demonstrated their fitness as trained specialists in surgery, was closed in January 1940.

EXAMINATIONS

The qualifying examination will be divided into Part I (written) and Part II (clinical, bedside and laboratory). In both of these parts, as previously stated, a knowledge of the practical application of the sciences fundamental to surgery will be required.

Part I. This examination will be given simultaneously in as many centers throughout the country as the board may determine suitable for the purpose, and is held twice a year, in the spring and fall. All applications must be on file in the board's office at least three months in advance of the examination. Candidates who are declared eligible are given ample notice as to the center to which they have been assigned for examination.

The examination in Part I is written and covers a one day period. There shall be two sessions of three hours each. The examination concerns itself primarily with general surgical problems and in addition the application of the basic sciences of surgery to these problems.

Part II. The board may, at its discretion, require that a satisfactory operative report be filed before a candidate is eligible for Part II. Such a report shall be made by a member of the Board, Founders Group, or one certified by examination, designated to be present during a major operating procedure performed by the candidate.

Part II of the examination shall be oral and practical and cover a one day period, the schedule being arranged somewhat as follows:

9 A. M.-1 P. M.—Clinical surgery (diagnosis, management and the application of physiology, biochemistry and bacteriology, as the case being examined on may offer an opportunity for doing so. Roentgenographic interpretation will also be included).

2-5 P. M.—Applied Anatomy and Surgical Pathology.

The board expects that every candidate shall be well prepared in applied anatomy and in surgical pathology. In the latter subject more stress is laid on the diagnosis of gross specimens than on the recognition of microscopic pathology.

Examinations in Part II are conducted in certain centers of the country selected by the board. It is the board's desire to arrange these centers so as to geographically meet the needs of the candidates, on condition that suitable examination facilities can be provided. Examinations in Part II are conducted by members of the board living in the region of the country in which they are held, together with selected members of the Founders Group resident in the centers chosen.

GRADES

A candidate must receive an average of 75 per cent for each part to be entitled to the board's certificate.

A candidate who fails in his examination in Part I shall have his papers reviewed by the Examination Committee.

REEXAMINATIONS

Part I. Candidates who fail Part I are required to wait one year before becoming eligible for reexamination.

Part II. Candidates who fail Part II in its entirety and those who fail in the single subject of clinical surgery are required to wait one year before establishing eligibility for reexamination. Those who fail either anatomy or pathology are required to wait six months. The board expects that during this period the candidate will make a reasonable effort to prepare himself in the subject or subjects in which he has failed.

Should a candidate fail one examination in parts I and II, further examination privileges will be decided in each individual instance by the Examination Committee, but only after the candidate has submitted satisfactory evidence of further substantial preparation. The board may, for good and sufficient reason, deny a candidate the privilege of further reexamination.

FEES

The fee for the examination is $100, payable as follows: $10 registration fee, $30 for Part I and $60 for Part II.

Candidates shall be required to pay a fee of $30 for reexamination in Part I and $60 for reexamination in Part II.

This board is a nonprofit organization. All fees will be used, after a reasonable amount is set aside for necessary expenses to aid in improving existing opportunities for the training of the surgeon. The members of the board serve without remuneration.

CERTIFICATION

After meeting the requirements for eligibility and passing the examination, a certificate attesting to a candidate's qualifications in surgery will be issued by the board, signed by its officers.

The board has discharged its responsibilities by conducting examinations and has issued certificates of qualification to those surgeons who have met certain clearly specified educational requirements and have successfully passed its examinations. In discharging its responsibilities, the primary purpose of the board has been to establish and maintain desirable standards in the education and training of the young surgeon.

The American Board of Surgery has never been concerned with measures that might gain special privileges or recognition for its certificants in the practice of surgery. It is neither the intent nor has it been the purpose of the board to define requirements for membership on the staffs of hospitals. The prime object of the board is to pass judgment on the education and training of broadly competent and responsible surgeons, not who shall or shall not perform surgical operations. The board specifically disclaims interest in or recognition of differential emoluments that may be based on certification.

BOARD OF THORACIC SURGERY

(An Affiliate of the American Board of Surgery)

CARL EGGERS, Chairman, New York.
CAMERON HAIGHT, Vice Chairman, Ann Arbor, Mich.
WILLIAM E. ADAMS, Chicago.
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EMILE HOLMAN, San Francisco.
GEORGE H. HUMPHREYS, New York.
RICHARD HARWOOD SWEET, Boston.
WILLIAM M. TUTTLE, Secretary-Treasurer, 1151 Taylor Avenue, Detroit 2, Mich.

FUNCTIONS OF THE BOARD

1. To select Founder Members. This group is composed of surgeons, who have made meritorious contributions to thoracic surgery, as follows:

(*a*) Active and senior members of the American Association for Thoracic Surgery, who have been certified by the American Board of Surgery, are eligible for consideration as Founder Members.

(*b*) Other surgical members of the American Association for Thoracic Surgery will have their records reviewed by the board, and may be recommended for Founder Membership with or without application.

(*c*) Other surgeons, certified by the American Board of Surgery, who on application, and after review of their qualifications, are found to meet the requirements of the thoracic board.

The Founders Group will be kept open for two years after the organization of the board.

2. To conduct examinations of satisfactory candidates who seek certification by the board.

3. To improve the opportunities for the training of thoracic surgeons.

4. To set up principles of education to guide young surgeons who desire to prepare themselves for proficiency in thoracic surgery.

5. To issue certificates of qualification to all those meeting the board's requirements.

REQUIREMENTS

1. Certification by the American Board of Surgery.

2. Two years' training in thoracic surgery approved by the Board of Thoracic Surgery, or meritorious contributions to thoracic surgery. One of these two years may be spent during the four years of training in surgery required by the American Board of Surgery.

3. Written, oral and practical examination.

DEFINITION

To qualify for the examination in thoracic surgery, the candidate shall have had two years of training in an active, well-integrated thoracic surgical clinic or clinics, or the equivalent amount of thoracic surgical training on a mixed service consisting of thoracic and nonthoracic surgical cases. Adequate training in both the tuberculous and nontuberculous aspects of thoracic surgery is expected. In order to obtain this objective, combined residencies between institutions of different types may be advantageous. It is also required that the candidate be familiar with the basic sciences as related to thoracic surgery. Under exceptional circumstances certain surgeons may, by virtue of recognized proficiency in the surgical treatment of thoracic diseases, qualify for the examination at the discretion of the board.

APPLICATIONS

Prospective candidates desiring to apply for examination should consider whether they are able to meet the minimum requirements of the board. They should then submit a letter to the secretary's office, outlining briefly their training and experience in thoracic surgery and ask for an application form. An application form will not be sent unless evidence is submitted in a letter indicating that the prospective applicant appears to meet the minimum requirements.

EXAMINATIONS

The Board of Thoracic Surgery will be governed in general by the rules laid down by the American Board of Surgery pertaining to examination, as well as reexaminations.

Rules may be changed, however, at the discretion of the Board of Thoracic Surgery.

FEES

Founders Group. To those who will be admitted to this group, a certificate will be issued. The fee will be $50.00.

Group to be certified by examination. For the special examination in thoracic surgery and the issuing of a certificate, the fee will be $100.00. Fifteen dollars of this fee is to accompany the application and will be considered as a registration fee. It is nonreturnable to the applicant in case he is disapproved for examination.

Reexamination. The fee for reexamination will be $25.00.

AMERICAN BOARD OF UROLOGY

GILBERT J. THOMAS, President, Beverly Hills, Calif.
GEORGE F. CAHILL, Vice President, New York.
CHARLES C. HIGGINS, Cleveland.
A. I. DODSON, Richmond, Va.
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Office of the Secretary-Treasurer: 314 Corn Exchange Bldg., Minneapolis 15.

EMERITUS MEMBERS

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CLARENCE G. BANDLER, New York.
GEORGE GILBERT SMITH, Brookline, Mass.

APPLICATION BLANK; REQUIREMENTS FOR ALL APPLICANTS

Application for certification must be made on a special form. This will be provided by the secretary and must be returned to him accompanied by other required data and credentials, and by $50 of the examination fee.

Requirements for Applicants.—Each applicant, before he shall become eligible to take the examination for certification in urology, must:

A. Have graduated from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association and must have completed an internship of not less than one year in a hospital approved by the same council. (The former requirement is not applicable to a candidate who graduated from an institution now extinct or whose graduation occurred before the American Medical Association had prepared a list of accredited medical schools.) All graduates of foreign medical schools must obtain a license to practice in the state or province in which they reside, the certificate of the National Board of Medical Examiners and/or the certificate of graduation from a medical school recognized by the Council on Medical Education and Hospitals of the American Medical Association as capable of providing training comparable with that recognized in a "Class A" medical school.

B. Establish in a manner satisfactory to this board that he is a physician duly licensed by law to practice medicine, that he is of high ethical and professional standing and that he has received adequate special training in urology.

The board is attempting to increase and to standardize the facilities for urological training in teaching institutions, so that the expression "special training in urology" may be interpreted to include:

A period of study, after the internship, of not less than three years in clinics, dispensaries, hospitals or laboratories recognized by the Council on Medical Education and Hospitals of the American Medical Association as competent to provide a satisfactory training in the special field of urology.

The training requirements after the internship may be fulfilled in one of the following ways.

1. A three year residency in urology.

When a resident obtains a senior rating or is in his final year of training, he should be in charge of the examination and treatment (surgical or otherwise) of an ample number of patients under the supervision of the senior consultant or attending urologist, who must be certified by the American Board of Urology.

2. A second year of rotating internship or a one year residency, preferably in general surgery, followed by a two year urologic residency, which should have the same status as the last two years of a three year urologic residency.

3. Preceptorship.

This type of training may be accepted, but it is not encouraged.

This, and other variations from training described above, must be supported by evidence that the candidate has had training comparable with one of the two preceding types of residencies.

4. An additional period of not less than two years in the practice of urology in the city from which he makes application. These special requirements conform with the suggestions made by the Council on Medical Education and Hospitals of the American Medical Association.

After June 30, 1955, candidates for certification by this board will be required to spend four years in training after the internship. One of the four years will be devoted to general surgery and not less than twenty-four months will be in urology. One year will be optional, devoted to the basic sciences, surgery, or research.

Candidates will be permitted to substitute two years of preceptorship for one year of training, but only toward the optional year of training, mentioned above.

After training requirements have been fulfilled, candidates will be required to be in practice for three years in one location before appearing for the examinations.

C. Make application to the American Board of Urology, whose duty it shall be to investigate the applicant's credentials and make a survey of his character.

D. Assure the board that he is engaged in the practice of urology and that he intends to continue to be so engaged.

E. Membership in the American Medical Association or comparable national medical association is recommended.

FEE

The examination fee is $100 (this fee will be increased when the expense of the examinations and other activities of the board demand). Fifty dollars must accompany the application. If, on investigation, an applicant is found lacking in any of the requirements stated herein, he will be notified that he is ineligible for examination. Sixty-five dollars must be paid when the applicant is accepted as a candidate for certification. Neither fee shall be returnable in any event.

If a candidate fails, he will be permitted a second examination after one year or within three years, without additional fee, but he must give sixty days' notice of his intention to appear for reexamination. After an applicant has failed twice, he must file a new application and pay a second fee.

REQUIREMENTS FOR CERTIFICATION

According to the by-laws of the American Board of Urology, applications received from applicants for certification shall be examined by the Credentials Committee and reviewed by the board. When additional data are required to complete the application, these will be requested by the secretary.

The requirements for certification include: preparation of reports of fifty major urological cases, under the candidate's own supervision, which must contain all items essential for diagnosis, therapy and prognosis and results of treatment; oral-clinical examinations, and written examinations and personal appearance before the board.

In specific instances, the board may waive any part of these requirements, with the exception of the item of personal appearance.

Each candidate will receive a notice of the time and place of the examinations, and an appointment for his personal appearance before the board.

EXAMINATIONS; REPORTS OF CASE HISTORIES

The board will hold one examination per year. This may be held in association with the annual meetings of the American Urological Association or the American Medical Association, when this is practicable, or at other times and places that the board may select, or deem expedient.

The written examinations are designed to test the candidate's preparation in, and his knowledge of, the whole field of urology, including the fundamental subjects: pathology, anatomy, physiology, embryology, bacteriology, physiological chemistry and endocrinology. These may be given at the time of the oral-clinical examination, or may be held on certain dates simultaneously in different parts of the country at places convenient for candidates. The examination in pathology will consist of the identification of gross specimens and of sections of tissue observed through the microscope. The examination in anatomy, physiology, embryology, bacteriology, physiological chemistry and endocrinology will be a test of the candidate's working knowledge of these subjects as they are related to the practice of urology.

The oral-clinical examination will consist of discussions of common urological conditions. The subjects forming the basis of this examination are urography; diseases of the genital organs, including the prostate; diseases of the urinary bladder and diseases of the ureters and kidneys. The examination may deal directly with data found in the reports of case histories that the candidates have submitted. It will ascertain the candidate's familiarity with recent literature, the breadth of his clinical experience and his general qualifications for practice in the specialty of urology.

The professional adaptability of each candiate will be investigated in an attempt to determine his ethical conduct and his attitude toward his patients and fellow practitioners.

The reports of twenty-five major urological cases must be representative cases from private practice. Sufficient data should appear in these so the examiner will know that a proper history was taken and that a thorough examination, including a complete physical survey, was made.

Case reports that are copied verbatim from a hospital record are not accepted. They must be identified by the name of the hospital and the case admission numbers, with the pertinent dates. The reports must be typewritten on 8½ by 11 paper and in duplicate, but need not be on any special forms.

The data should be placed under proper headings and the arrangement of these should conform to the sequence of events incidental to the patient's admission to the hospital or clinic, the examinations made and treatment prescribed.

The board requires that all of the essential points of the history and examination, as well as a complete description of the surgical procedure, shall be given. Emphasis should be placed on the following items: preoperative diagnosis, clinical and pathological diagnosis, laboratory data, including cultures of urine and chemical analysis of calculi; summary of postoperative course with special reference to morbidity, clinical findings at time of discharge from the hospital and subsequent "follow-up" reports.

A final short paragraph must be prepared for each case. This must include the candidate's interpretation of the history in terms of pathology; the basis for the diagnosis; the facts that determined the treatment prescribed, whether surgical or otherwise; the course of treatment to be pursued following discharge from the hospital or clinic; a critical discussion of the knowledge gained from the proper handling of the case, or from the errors made (if any) in the diagnosis and method of treatment.

Complete separate index lists must accompany the reports. If the reports are obtained from more than one hospital they must be consecutive and a separate index list of each group should be provided. These lists must state the operator's name at the head of each page, the name of the patient, the hospital and admission number and the dates of operation, operation performed and the result. Statements from the superintendents of the hospitals attesting that the candidate was the operator must be included. The lists will be filed in the secretary's office for verification purposes.

Each candidate must assume personal responsibility for the data in his case reports, including autopsy findings and interpretation of urograms.

A candidate must remember that these case reports are documentary evidence of his ability and that the material in them and the manner of presentation are important evidences of his competence as a urologist.

Satisfactory case reports must be submitted before a candidate will be permitted to continue with other parts of his examination. If case reports are pronounced unsatisfactory by more than one examiner, the candidate will be informed of this and requested to prepare others.

The deadline for the receipt of case histories in the board office is Sept. 1.

LIMITATIONS OF FUNCTIONS OF THE BOARD

The conferring of degrees, "Doctor of Medicine" or "Bachelor of Medicine" remains with the universities, where it belongs, and this board makes no attempt to control the practice of urology by license, or legal regulations. The board does not intend to in any way interfere with or limit the professional activities of any duly licensed physician.

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THE FIFTIETH ANNUAL REPORT ON MEDICAL EDUCATION

The fiftieth annual report on medical education prepared by the Council on Medical Education and Hospitals and published in this issue of THE JOURNAL presents information and statistics on many subjects of current importance.

During the academic year 1949-1950, all records for total enrolment and the number of students admitted to approved medical schools in the United States were surpassed. The total enrolment of 25,103 constituted an increase of 6 per cent over the preceding year. The freshman class for the first time numbered more than 7,000 students. The exact number, 7,042, represented an increase of 5.3 per cent over the preceding year and an increase of 17 per cent over the average size of the freshman class in the 10 years preceding World War II. From estimates presently available, it seems certain that the freshman class that will enter medical school this fall will be even larger.

Last year it was predicted that the number of students admitted annually to the medical schools in the United States would soon reach 7,000. On the basis of the record of the past year, the new schools that are being organized and the expansion of existing schools that is under way, it now seems likely that within the next few years the freshman class will number close to 7,500 students.

To make possible the expanded enrolments that have been achieved and the further increases that are in prospect, it has been necessary for the medical schools to secure additional operating funds and additional facilities. The budgets of the medical schools for 1950-1951 total approximately $67,500,000. After corrections have been made for changes in the methods of reporting budgets by some schools and for the new schools that have been included in the interval, it can be calculated that the budgets of the medical schools have increased by $19,500,000, or 42 per cent, in the last four years. Figures for the cost of new construction that was completed, started or authorized during the past year were available for only one-half the projects reported. For these projects the cost totaled more than $100,000,000.

The foregoing record with respect to enrolments, budgets and construction makes it clear that much is being accomplished through increased local support in the matter of expanding enrolments in the medical schools and in providing the additional funds and facilities needed for this purpose. It is true that the publicly owned schools have tended to fare better in the postwar period than have the private schools. Local support, however, has never been evenly distributed and probably never will be. Local support of medical schools, as of other institutions and activities, is governed by many variable factors, including the prosperity, loyalty and generosity of the benefactors and the initiative displayed and the confidence inspired by the beneficiaries. While a number of schools continue to have difficult financial problems, the record of the improved support and of the expansion of the facilities for medical education over the past four years should serve to caution against the acceptance of alarmist claims that, without the immediate provision of federal aid to medical schools, the supply of physicians will be reduced and the standards of medical education impaired.

The Council's report presents a preliminary discussion of medical education in relation to the current emergency. It is too early to predict the impact of the action in Korea on medical education. A joint committee of the Council and the Association of American Medical Colleges has been established to study problems emanating from the emergency and to make recommendations for their solution. Much valuable experience, both favorable and unfavorable, was gained during World War II, and it is hoped that the plans adopted to meet the current emergency or its sequelae will reflect the lessons learned from this earlier experience.

Statistics on a variety of subjects of general interest are included in the Council's report. Student fees will provide only $15,200,000, or 22.5 per cent of the budgets of the medical schools. Fees for 1950-1951 range from $97 to $867, with an average of $554 and a median of $600. The minimum cost to students of attending medical school for one academic year, including expenditures for tuition, other fees, books, equipment, all essential living and travel, ranges from $567 to $2,252, with a median of $1,473. The estimates of the average cost submitted by the schools ranged from $800 to $2,500, with a median of $1,800.

The number of students other than undergraduate medical students during the past year for whom the medical schools accepted responsibility for instruction totaled 32,506, or almost 30 per cent more than the total

number of undergraduate medical students. It has long been recognized that the research and service programs of the medical schools constitute major activities which approach and in some institutions even surpass the importance of undergraduate instruction. The statistics with respect to the other students for whom the medical schools are now responsible make it clear that the instruction of these students constitutes still a fourth major function of the medical schools.

Vacancies on instructional staffs decreased during the past year. These vacancies are primarily the result of the insufficient number of young teachers trained during World War II. Twenty schools this year had no unfilled full time positions. In the remaining 59 schools there was a total of 175 unfilled full time positions in the preclinical departments and 104 in the clinical departments.

The report of the Council provides indisputable evidence of the progress of medical education in this country. It offers reason for proud reflection on what can be done when freedom and opportunity exist and is a ringing denial to those who believe that this country, its people and its opportunities are incapable of effecting progress without a tightly held supervisory rein. Given the opportunity, Americans like all citizens of a free country can recognize their needs and solve their problems.

THE NATIONAL BOARD OF MEDICAL EXAMINERS

Lack of reciprocity agreements between state licensing boards frequently creates serious problems for physicians desiring to move from one state to another. Unless the states in question agree on reciprocity, the physician usually finds that he must wait for the next regularly scheduled examination of the licensing board of the state to which he intends to move before he can become licensed. This may cause a considerable delay in his plans and, unless he is a recent graduate, may necessitate arduous review of those phases of the basic and clinical sciences that have not borne directly on his field of practice.

In moving a practice from one state to another the licensure problem is usually simplified if the physician is a diplomate of the National Board of Medical Examiners. This board was founded in 1915 with the chief purpose of establishing a qualifying examination of such high character that successful candidates could safely be admitted to the practice of medicine by all state boards of medical licensure without further examination. The objective of the board has for all practical purposes been achieved. The certificate of the National Board is now accepted as an adequate qualification for a medical license by the licensing authorities of all the 48 states except Florida, Montana and Wisconsin. In a few states a brief oral or supplementary written examination is required or other technical requirements must be complied with. The certificate is also accepted by the territories of Alaska, Hawaii and Puerto Rico and by the Isthmian Canal Zone. Of the 19 states with separate examining boards in the basic sciences, the laws of nine are sufficiently broad to enable them to accept the examination of the National Board in lieu of their own.

The growth in popularity of the National Board examinations can be judged from the fact that in the past 25 years the number of physicians completing these examinations annually has increased from 206 to 1,674. Of the total of 12,181 licenses issued in the United States, its territories and outlying possessions in 1949, 2,536 were granted on the basis of the certificate of the National Board of Medical Examiners.

It seems likely that even more physicians would seek the certificate of the National Board if at the time they graduated from medical school they had a fuller understanding of the greatly increased freedom from licensure worries that it gives the physician in selecting or changing the location of his practice. Some students are probably dissuaded from taking the examinations of the National Board because the cost is somewhat higher than that of most state board examinations. The higher cost is accounted for by the fact that the examinations are longer and more detailed than those conducted by state boards. The additional charge is small in comparison with the later saving that possession of the National Board certificate may make possible. Further, the full fee of $75 need not be paid at the time the examination is completed, since the board has established a loan fund which is available to all candidates taking the third part of the examination.

Many students will appreciate the full value of the certificate of the National Board only in later years. Some medical schools now require that all students take the examinations of the National Board, and many other schools recommend that they be taken. Schools that urge their students to take these examinations are performing a real service for their students.

ADMISSION TO MEDICAL SCHOOL

In recent years the difficulties students encounter in gaining admission to medical school have been greatly magnified in the minds of many of the public and the medical profession alike. In public and private discussions of the subject the belief has not infrequently been expressed that the medical schools will admit only students who have made an "A" average in college or that only one out of every 10 or 15 of those who apply can be admitted.

The current report of the Council on Medical Education and Hospitals reveals that last year 73 per cent of the 74 medical schools in the United States that

submitted data on this subject admitted some students who had made less than a "B minus" average in their college work. Actually 9 per cent of the freshmen in the 74 medical schools reporting fell in this category. Statistics were not obtained as to the number of other students who were admitted with less than an "A" average, but it may be presumed to be large. In considering an applicant for admission, a medical school must of necessity weigh heavily his past scholastic achievements. Most medical schools, however, would not consider selecting their students on the basis of marks alone, any more than patients would be willing to choose their physicians solely on such a basis. Medical schools properly recognize that outstanding qualities of character, personality, aptitude and motivation can compensate for a relatively low academic standing.

With respect to the ratio of accepted students to applicants official figures compiled by the Association of American Medical Colleges show that a total of 24,434 persons applied for admission to the 1949 freshman class in the medical schools of the United States. This class numbered 7,042 students. Thus, approximately one out of every 3.5 applicants was successful in gaining admission.

The experience of every medical school demonstrates that each year large numbers apply for admission whose only qualification is the wish to study medicine. If statistics could be obtained which would make it possible to eliminate from the total number of applicants the grossly unqualified and those reapplying after being rejected in previous years, it would probably be found that the difference between the number of students accepted in a given year and the number of qualified applicants who completed their undergraduate college work in that year would not be great. It is important that there be a better understanding generally of this fact. Otherwise many capable young men may be misguidedly discouraged from considering the study of medicine.

THE MEDICAL SCHOOLS AND GENERAL PRACTICE

The report of the Council on Medical Education and Hospitals indicates that interest on the part of medical schools in preparing students and recent graduates for the general practice of medicine continues. Last year's Educational Number reported that 42 schools had established programs designed to stimulate the interest of students in careers in general practice. This year there is a further report that 25 medical schools are sponsoring in their affiliated hospitals internships or residencies, or both, that are specifically planned to meet the needs of prospective general practitioners. A number of additional schools report that they have similar programs under consideration.

An important trend in medical education is the increasing number of schools that are including preceptorships with general practitioners as part of the medical school curriculum. Thirteen schools now offer preceptorships, nine having established them within the last two years. The principal purpose of this assignment is to expose the student in his formative years to the challenge of general practice and to the influence of a physician whose career is dedicated primarily to service in the practice of medicine. The preceptorships, which are frequently conducted in cooperation with the state medical society, are scheduled in most instances to supplement rather than replace existing assignments in the curriculum.

It may be predicted that the current experience with the preceptorial system will be subjected to a critical analysis on the part of medical educators generally. The essential task for the schools and medical societies that offer preceptorships will be to demonstrate that in a decentralized program of this type adequate educational standards can be maintained. If this aim is to be achieved, it would seem important that the assignment of students to a practitioner be clearly dependent on the practitioner's willingness to devote sufficient time and interest to the program. The fact should be faced squarely that, in a properly conducted preceptorship, the preceptor must make sacrifices for which he is not recompensed. Students must be assured of adequate supervised experience with patients but should not be asked to assume responsibilities for patients for which they are not qualified. Their exploitation in the performance of excessive amounts of laboratory work or unrewarding clerical activities should be prohibited. The relationship between the preceptors and the medical school should be such that desirable adjustments in the program can be made readily without the creation of ill feeling. If the practitioners of a state and the faculty of a medical school will sincerely devote themselves to the development of an educational program based on these principles, the rediscovery of the preceptorship may come to be judged one of the significant innovations in modern medical education.

Polls taken in 19 medical schools during the past year reveal that the percentage of students planning to enter general practice has increased from 36 to 47 in the last three years. The percentage planning to specialize has decreased from 36 to 31. The other students polled in both periods had still to make a decision. How much of this trend can be credited to the various programs instituted by the medical schools in recent years and how much is due to other causes is not known. It was pointed out in these columns several years ago that many forces influence medical students in the choice of a career and that the responsibility for the future of general practice falls on the public, the hospitals and the entire medical profession as much as it does on the medical schools.

SERVICE IN ARMED FORCES FOR RESIDENTS

Legislation calling for a registration of certain specialist personnel for the Armed Forces has passed both houses of Congress and probably will be signed by the President by the time this appears. It is expected that a large percentage of the physicians in the United States will be obliged to register. Under both bills the first group that will be called for active duty are those young physicians who received all or part of their medical training at government expense or who were deferred for other reasons. Many of these young physicians are willing to serve in the Armed Forces but are hesitant about volunteering for various reasons. A number of them are at present taking training as residents, and many are in their last year of such training.

If the Armed Forces follow their present policy, they will not call men in their last year of residency training but will allow them to be deferred until this training is completed. In the case of residents who have not reached their final year of training, it is hoped that the armed services will assign these persons, should they be called, to positions where they may continue in their chosen specialty and at the same time render the best type of service to the sick and wounded. It is realized that in many instances this will be impossible, as there are jobs to be done for which there may be no similar medical specialty in civil life.

The American Medical Association is requesting the armed services to keep some form of authentic record of all services rendered by the individual in any specialty field. It is also requesting the specialty boards to take due cognizance of this and allow credit toward ultimate certification. It is hoped that some satisfactory arrangement can be made for this.

Physicians who expect to be called up should volunteer and not only be sure of a better assignment but also take advantage of the extra $100 per month incentive pay which is still available to volunteers but not to those inducted.

LIVER CIRRHOSIS IN PARASITIC DISEASES

An important parasitic disease is due to the blood fluke Schistosoma haematobium. In some countries schistosomiasis causes more sickness and death than any other single disease. It has been estimated that 6 million of the 12 million inhabitants of rural Egypt are infested with S. haematobium and 3 million with S. mansoni and that at least one and a half million are infested with both species together (Scott[1]). Cirrhosis of the liver may follow infestation by these parasites. In Egypt, Symmers[2] described a variety of cirrhosis with the presence of ova of Bilharzia. It is characterized by enormous thickening of the periportal connective tissue and is sometimes called "pipestem" cirrhosis. In China, Japan and the Philippines there is a disease known as Asiatic schistosomiasis, which is characterized by cirrhosis of the liver, splenomegaly, ascites, dysentery, progressive anemia and sometimes by focal epilepsy. The disease occurs extensively in one district of Japan, where it is called "Katayama disease." It seems that Asiatic schistosomiasis, or, as it is otherwise known, urticarial fever, is not uncommon in these countries and is associated with parasites in the vessels of the alimentary canal and elsewhere, and with eosinophilia, urticaria and fever. Cirrhosis of the liver with attendant ascites is usually a late change, occurring three to five years after infestation. Another form of so-called parasitic cirrhosis is associated with the deposition of schistosome eggs in the liver, the ova acting as foreign bodies giving rise to focal granuloma in which there are multinuclear giant cells of the Langhans type. It is significant that until 1926 Cutler[3] was able to collect reports of only 22 cases of schistosomiasis in the United States and Canada. That the incidence of the disease is increasing in North America is suggested by the fact that since 1933 necropsy has been performed at Bellevue Hospital alone (Symmers[4]) in 5 cases of schistosomiasis. All of them occurred in Puerto Ricans and other Latin Americans. In the perilobular granuloma of this form of cirrhosis some of the ova are well preserved, others are in different stages of disintegration and still others are calcified. The better preserved ova present lateral spines and are easily distinguishable from the ova of Bilharzia, in which the spines are terminal. In some of the granulomas the ova are partially or almost completely surrounded by phagocytic multinuclear foreign body giant cells together with variable numbers of lymphocytes, plasma cells, eosinophils and polynuclear neutrophils, while at the periphery are circumferentially arranged epithelioid cells, the whole resembling the exudative tubercle in the early stages of repair. Still another variety of cirrhosis is said to be due to Clonorchis sinensis, a liver fluke most commonly encountered among the Sino-Japanese people. Some investigators have stated the belief that dietary deficiencies should be considered as factors contributing to cirrhosis of the liver in patients with parasitic disease, since it seems doubtful that relatiavely innocuous foreign bodies, such as ova, acting alone, can cause perilobular cirrhosis.[4]

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2. Symmers, W. St. C.: Note on a New Form of Liver Cirrhosis due to the Presence of the Ova of Bilharzia Haematobia, J. Path. & Bact. **9**: 237, 1904.

3. Cutler, M.: Bilharziasis in the United States and Canada, J. A. M. A. **86**: 816 (March 20) 1926.

4. Symmers, D.: Liver Cirrhoses, J. South Carolina M. A. **46**: 115, 1950.

WASHINGTON NEWS

(From the American Medical Association Washington Office)

Call of Physicians to Service

In one week of fast action Congress made up for more than a month's delay on the calling of physicians to service in the armed forces. Within the week both House and Senate passed separate bills, conferees met and adjusted differences and final votes were taken which permitted sending the bill to President Truman for his signature.

This concentrated attention followed a full month of inattention on the part of Congress. During August the military medical situation became so critical that the Army ordered a call for 734 medical reserve officers. Meanwhile, with both houses planning to recess, the possibility arose that a bill for calling of physicians would not be passed until after the first of the year.

The first indication that a bill would be enacted appeared in the Senate, where the sponsor on the floor and committee was Senator Lester Hunt (Democrat, Wyoming). He hurried a bill through the Armed Services Committee, of which he is a member, and almost immediately got unanimous consent for a vote on the floor of the Senate. The House, trailing well behind the Senate, did not complete hearings until just four days before the bill was finally passed and turned over to the White House.

The law for the calling of physicians will be effective until next July. Under it physicians may be called to service for a period of 21 months, without their consent, according to priorities specified by the bill. They are:

1. Former ASTP (Army) and V-12 (Navy) men who have not served on active duty (in military services, Coast Guard or Public Health Service) and others deferred from service to continue their education during World War II and who have had less than 90 days of active duty in the services mentioned.

2. Members in the above groups who have had more than 90 days' active duty but less than 21 months.

3. With no reference to the above groups, those who did not have active service subsequent to Sept. 16, 1940; this could include postwar medical graduates as well as other physicians who have not served and who have not reached their fifty-first birthday.

4. All others, including World War II nonreserve veterans. Men in this group would be called on the basis of extent of duty; for example, those with least duty to be called up first.

Reserves need not register, nor may they be called under provisions of this act, because they already are under military orders. Any men required to register under this act have the opportunity to qualify for the $100 monthly pay bonus, even after registration, by volunteering.

Registration is required of every physician and dentist who has not reached his fiftieth birthday and is not a member of the reserves. Details as to time of registration and military regulations will be announced by Selective Service and the military medical departments.

Although the Senate rushed through its version of physician registration legislation with almost no debate, House members took time to inquire into almost every provision, using fully the two hours which had been allotted. But the final vote was decisive, 363 being for the bill and one, Representative Vito Marcantonio, against.

Representative Carl Vinson (Democrat, Georgia) chairman of the Armed Services Committee, handled the bill on the floor and answered most questions. He was assisted by Representative Carl T. Kilday (Democrat, Texas), who disagreed with the chairman on some points but argued for passage. Representative Dewey Short (Republican, Missouri) parceled out time for Republicans.

Mr. Kilday admitted the bill was discriminatory but said he was confident that it came within the provisions of the Constitution. "This is an individual group, picked out from the population and subjected to special requirements," he said. "There is no other group like it."

Mr. Kilday, referring to the fact that $100 monthly pay bonus would still be extended to men who volunteer, said this was not the intent of the original pay-bonus legislation. "I was chairman of the committee which worked on the Career Compensation Act of 1948," he declared. "I can say that it never was the intention of the committee that men who had their education paid for by the government should be paid $100 extra, and given first lieutenant commissions, so they would serve."

He said that, while the legislation is not perfect, he is confident it will ease the pressure on the reserves and allow for an orderly induction of physicians in inverse ratio to their previous military service. Representative Walter Judd (Republican, Minnesota) a physician-member, thought the military services should be made to justify their need for a certain number of physicians. He said 4.5 per thousand, mentioned by Mr. Vinson, was three times the civilian ratio of physicians. Mr. Vinson declined to give a direct answer to this but repeated several times that this was something on which the House would have to take the word of the military.

Dr. Judd also questioned whether the wording of the bill actually exempted from active duty men who might have served extensive periods of nonmilitary assignments, for example, as combat infantrymen. At first Mr. Vinson said they would not be exempted, because that time had not been served as medical officers. Later, he corrected this statement, declaring these men would not be called.

Another physician-member, Representative A. L. Miller of Nebraska, warned the House, "This will not solve all of our medical problems; there are not enough men in these ASTP and V-12 categories." He also said the military services were wasting military manpower, that physicians now in service were not being used properly. On this Mr. Vinson said the committee had the assurance of the Surgeons General that more efficient policies were being put into effect.

Representative Percy Priest (Democrat, Tennessee) pointed to the urgency of the situation when he said that at least 20 reserve doctors in his district—with from two and one-half to four years of World War II duty—had received alert orders. He noted that the bill would induct men with little or no service before it would call reserves of this type to duty.

At the end of the two hour debate period, the House adopted one amendment which would extend registration age from 45 to 50 years. The previous day the Senate had passed its version of a doctor-draft bill, which differs in some details from the House bill. Indications were that the bill would receive final approval early in September.

Aid to Medical Education

For the fourth time this year the House has indicated that it will do nothing in the way of medical school aid—at least not until next session. The latest bill (H. R. 9508) introduced by Representative Andrew Biemiller (Democrat, Wisconsin) was tabled by the House Interstate and Foreign Commerce Committee by a vote of 15 to 8. Two previous bills on aid to

medical education were tabled by this committee by one vote margins. This was Mr. Biemiller's second bill to provide some type of federal support to medical schools.

Unlike the earlier bills which called for scholarships, H. R. 9508 provides construction and equipment grants only. These grants would total $15,000,000 annually for the next five years, with the federal government paying no more than 50 per cent, and would go directly to institutions instead of to states as provided in previous bills. A National Council on Education for Health Professions would serve as an advisory body to the Surgeon General in administering the act. The Surgeon General would be instructed to "so far as practicable give priority to areas in which facilities are either nonexistent or inadequate." Besides medical schools, schools of nursing, dentistry and public health would be eligible for grants.

The action of the House Interstate and Foreign Commerce Committee on this entire subject is as follows:

1. H. R. 5940 was recalled by the committee from the Rules Committee for further work.

2. The committee almost completely rewrote H. R. 5940 and tabled it by a one vote margin.

3. Representative Biemiller introduced H. R. 8886, an amended version of H. R. 5940. This was tabled, also by one vote.

4. Mr. Biemiller then introduced H. R. 9508, providing construction grants but no scholarships, and this was also tabled.

Military Notes

House and Senate hearings on doctor-draft bills gave witnesses opportunity to get various observations into the official records:

Major Gen. Lewis Hershey, Selective Service director, said that close to 60 per cent of draftees were unacceptable but that not more than 50 per cent of these were physically unfit. General Hershey, an effective and easy-going witness, followed this with the comment, "They tell me the boys can't intentionally flunk the mental tests, but I have more confidence in the American people. . . . I think we are rejecting more men now on the mental tests than we did in World War II."

Dr. Richard Meiling, head of Defense Department Medical Services, claimed: "Taking this ratio of doctors (4.5 per thousand troops) would not penalize the civilian population any more than it would be penalized by the draft itself. . . . I think any physician who is physically able to practice civilian medicine can practice in the military," if the military will only assign them to duty for which they are physically qualified.

Dr. Walter B. Martin, speaking for the A.M.A., said, "I think this (doctor-draft) would prevent depletion of some civilian communities the way they were in the last war under voluntary system. . . . Selective draft should not carry any stigma. . . . If $100 monthly bonus applies to any, it would apply all across the board." He said the A.M.A. supported the general objectives of all the bills under consideration and explained why. Then he made several additional observations:

1. No "inflexible, over-all ratio" of physicians to troop strength should be established, because it would not be "an entirely sound method of determining requirements. . . . it is impossible now to foresee the relative military and civilian needs in the future." In this Dr. Martin was supporting the three Surgeons General, who prefer to deal in actual requirements, not ratios.

2. Men called to service should not be required to remain on duty for more than two years, "except that this provision shall not apply in time of war or national emergency as declared by Congress. . . ."

3. While A.M.A. supports a doctor-draft, it "expects that the physicians required to serve will be assigned to duties which are essential to the war effort." He said they should not be required to care for veterans, for civilian employees within the United States or for dependents of military personnel within the United States except in areas where adequate medical care cannot otherwise be provided.

Brig. Gen. Paul Robinson, speaking for the Army Medical Department's personnel branch, asserted: "The mission—type of duty—should be the main determining factor in the number of doctors required, not the troop strength." Like other witnesses for the military departments, General Robinson resisted all efforts to induce him to state a doctor ration on the basis of troop strength. Dr. Meiling, civilian head of medical services, willingly discussed possible ratios but was not insistent that they be applied.

H. R. 9566 proposes extending medical advice, outpatient treatment and hospitalization to widows and minor children of deceased Coast Guard members, as well as to dependents of living members. . . . Gen. Clifton B. Cates, Marine commandant, commends the Navy for medical services being given Marines in Korea. His message was announced on the one hundred and eighth anniversary of the Navy Bureau of Medicine and Surgery. A total of 17 Navy medical personnel, mostly hospitalmen and corpsmen serving with combat Marines, have been killed or wounded or are missing in Korea. This compares with a total Navy casualty list of 10 for other branches. . . . New appointees to the Armed Forces Medical Advisory Board are Dr. W. Randolph Lovelace II, of Albuquerque, New Mex., and Dr. James Stevens Simmons, dean and professor, Harvard School of Public Health. This board advises the Defense Secretary and consults with Dr. Meiling on medical policies of the three military departments.

Meetings; Legislation; Agencies

At a three day convention of the American Federation of the Physically Handicapped in Washington, D. C., delegates "vigorously and vehemently" opposed the transfer of NEPH Week sponsorship from the Labor Department to the Federal Security Agency. General Hershey said some handicapped persons should be drafted into the Armed Forces because all jobs in the service do not require physical fitness. Senator John J. Sparkman (Democrat, Alabama) told the group to "keep on with your battle for a better program of rehabilitation aid," even though Congress might not take any immediate action. One panel discussed the role of the physician in total rehabilitation of the handicapped patient. . . . *Correction:* In the August 26 edition of THE JOURNAL, it was reported in this column that the National Conference on Aging recommended a National Council on Aging in RSA and a United States Institute of Gerontology. Resolutions on this subject were passed by two of the 10 sections, but the conference as a whole passed no resolutions. These resolutions, like other recommendations of the sections, were referred to a planning committee, but no further action was taken. . . . At a meeting in Martinsburg, W. Va., VA experts planned extension of training for its medical personnel in aspects of atomic warfare and radiological defense. . . . House Lobby Committee chairman Buchanan (Democrat, Pennsylvania) has asked for $25,000 more for salaries to complete the committee's work. . . . At hearings on S. 204, designed to cut down the cost of eye glasses and abuses by manufacturers, the Federal Trade Commission revealed that it had investigated 96 violations and had then turned the problem over to the Justice Department. Witnesses for optical manufacturers and optical associations stated that, contrary to Department of Justice claims, competition is keen, with 25 to 30 companies participating. Manufacturers said they would no longer do a retail business but that these measures would not lower the price of glasses. . . . The Senate has ratified the Organization of American States treaty, which provides, among other things, for improvement of health standards. Like Point 4 and United Nations programs, it will call on the Public Health Service to supply medical specialists for underdeveloped countries. . . . This is the twenty-fifth season of a joint Federal-State-Industry program designed to control the spread of shellfish disease. The Public Health Service reviews and rates the shellfish control programs of the various states. Interstate shippers must be certified and shellfish plants checked regularly. . . . Dr. William B. Marbury has been appointed chief of Navajo Medical Center, Fort Defiance, Ariz. . . . VA hospitals dedicated this month: Saginaw, Mich., 200 beds; Marlin, Texas, 200 beds; Grant Island, Neb., 200 beds; Spokane, Wash., 200 beds; Shreveport, La., 450 beds, and Altoona, Pa., 200 beds. VA expects to have six more hospitals in operation by the end of the year.

ORGANIZATION SECTION

Official Notes

ABSTRACT OF MINUTES OF BOARD OF TRUSTEES

The Board of Trustees met with the Coordinating Committee during the morning and part of the afternoon, Saturday, August 12, and it approved the following recommendations of that Committee:

1. That authorization be given to proceed with the advertising program of the Education Campaign, gearing it to the possibility of change in substance due to developments in the war situation.

2. That a letter be prepared by the Public Relations Counsel to be sent to various allied and lay organizations, giving the objectives of the American Medical Association in this project and pointing out its importance to all businesses in the country.

3. That the Coordinating Committee, through the Board of Trustees, urge the Council on Medical Service to make immediate contact with all local prepayment medical care plans, urging that whenever possible local membership campaigns be timed with the advertising campaign of the American Medical Association and, further, that after conference with Whitaker and Baxter suitable material be furnished to local organizations by the Council on Medical Service.

TRANSACTIONS OF SECTION ON OPHTHALMOLOGY

Authorization was given for the continuation of the publication of the Transactions of the Section on Ophthalmology and the hope was expresse ' that, with the assistance of the Section officers and trustee of the Knapp Testimonial Fund, it will be possible to get the ook out earlier than in the past.

EX. BITS FOR STATE SOCIETIES

The furnishing of exhibits on food fads and on brucellosis, with attendants, for the Medical Society of the District of Columbia and the Southern Medical Association was approved.

RESOLUTION ADOPTED BY WOMAN'S AUXILIARY

The following resolution, which was adopted by the Woman's Auxiliary of the American Medical Association, at its meeting in San Francisco in June, received approval:

WHEREAS, It is evident that existent trends toward socialism in governmental affairs call for a return to the fundamentals upon which this Democracy was founded; and

WHEREAS, It has been brought to our attention that not all of the states in the Union require the study of American history from the first grade through the colleges; and

WHEREAS, Knowledge of the pledge of allegiance to the Flag, the Declaration of Independence and the Constitution of these United States creates in youth an awareness of our heritage of freedom; therefore be it

RESOLVED by the Woman's Auxiliary to the American Medical Association that our Advisory Council be petitioned to request that state auxiliaries stress within their respective communities the inclusion of the aforementioned subjects in school curricula.

PUBLIC RELATIONS CONFERENCE IN CLEVELAND

The Board approved the holding of a Public Relations Conference in Cleveland on December 3 and 4 and voted to omit the Grass Roots Conference this year.

APPOINTMENT OF REPRESENTATIVES

The following physicians were appointed to councils or to represent the Association at various meetings:

Dr. R. L. Sensenich, to the Council on National Emergency Medical Service.

Dr. Thomas P. Murdock, delegate to the National Health Council.

Dr. W. B. Martin, representative of the Board of Trustees of the American Medical Association to the board of trustees of the National Medical Association, Inc.

Dr. J. Morrison Hutcheson of Virginia and Dr. Peter Murray of New York, representatives of the House of Delegates to the meeting of the National Medical Association, Inc., Hampton, Va., August 28 to September 1.

STUDY OF TWELVE POINT PROGRAM

In accordance with the action of the House of Delegates at its meeting in San Francisco in June, the Board instructed its Chairman to appoint a standing committee of three to study the Twelve Point Program of the Association and the whole situation as to policies, with a view to recommending whether or not a definite policy should be elaborated on or whether it would be advisable simply to set up certain basic principles on which the Association's policy is based.

ESTABLISHMENT OF HEALTH RESOURCES OFFICE AND HEALTH RESOURCES ADVISORY COMMITTEE BY PRESIDENT

The Secretary and General Manager was requested to write the President of the United States, expressing the pleasure and appreciation of the Board of Trustees on the establishment of the Health Resources Office at top level of the National Security Resources Board and the appointment of a Health Resources Advisory Committee, as well as to W. Stuart Symington, Chairman of the National Security Resources Board, relative to the action of the President, which the Association feels is a good move for medicine and for health in general.

LEGISLATION

Consideration was given to the various bills in Congress relating to the possible drafting of physicians, and the Board voted to support those bills which in principle provide for the registration and call to active duty of scientific and technical personnel in accordance with certain categories.

The preparation of a press release for the newspapers concerning these bills was approved.

BLOOD BANKS

The Board voted to accept the report of the Chairman of the Committee on Blood Banks, who, representing the American Medical Association, met in Boston with representatives of the American National Red Cross, the American Association of Blood Banks and the American Hospital Association to discuss ways and means of furnishing the best possible blood transfusion service for physicians, hospitals and patients who use the blood. While the Board of Trustees approved the agreement reached at the meeting to cooperate in time of peace or in a national emergency with the National Security Resources Board, it stated that the statement of policy adopted by the House of Delegates in June 1948 is not to be affected by that agreement. The statement which emanated from the meeting is outlined rather fully in an editorial in THE JOURNAL, Aug. 19, 1950, page 1417.

THE SCIENTIFIC EXHIBIT, CLEVELAND CLINICAL SESSION

The Clinical Session of the American Medical Association will be held in Cleveland, Dec. 5-8, 1950, with an outstanding program for the physician in general practice. The Scientific Exhibit will be presented as one of the features of the meeting, exhibits being correlated so far as possible with the general lectures and clinical presentations. Among the subjects which will be included in the exhibits are anesthesiology, cancer, cardiovascular disease, dermatology, diabetes, fluid balance, gastrointestinal disturbances, medical therapy, neuropsychiatry, obstetrics, pediatrics, poliomyelitis and surgery.

Application blanks for space in the Scientific Exhibit are now available. Physicians interested in participating in this activity should apply at once, since the program will soon be completed. Application blanks may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 N. Dearborn Street, Chicago 10.

GOVERNMENT SERVICES

Army

Personnel Chief Promoted to Brigadier General

Col. Paul I. Robinson, chief of the Surgeon General's Personnel Division, has been promoted to the rank of brigadier general. General Robinson has headed the Personnel Division since August 1947. Among his achievements are guidance in career management, postwar procurement of medical officers, the intern and residency programs and the better use of professional personnel. In January 1945, Colonel Robinson was assigned as deputy surgeon of the U. S. Army Forces in the Far East. Returning to the United States in 1946, he served briefly as instructor at the Army Industrial College and then assumed command of the St. Louis Medical Depot. He has also served as chief of the fiscal, supply planning, and material demobilization divisions of the Surgeon General's Office.

Commanding Officers of Hospitals at Newly Opened Camps

The Army Surgeon General has announced the selection of commanding officers for the Army hospitals reopening at recently activated Army camps. Reactivation of some of the camps began on August 1; all the hospitals will be opened by September 1. Selections, all Medical Corps, and their last assignments are as follows:

Camp Edwards, Massachusetts, Lieut. Col. James P. Pappas, from Fort Devens, Massachusetts. Lieut. Col. Stephen Berardinelli was named commanding officer of the hospital at Fort Devens, which is currently being expanded.

Camp Pickett, Virginia, Col. James B. Stapleton, from Letterman Army Hospital, San Francisco.

Camp Breckinridge, Kentucky, Col. Carlton D. Goodiel, from Physical Standards Division, Office of the Surgeon General.

Camp Rucker, Alabama, Col. Mack M. Green, from Fitzsimons Army Hospital, Denver.

Camp Stewart, Georgia, Col. William B. Draper, from Station Hospital, Camp Lee, Virginia.

Fort Jackson, South Carolina, Col. Kermit Gates, from headquarters, Sixth Army Area, San Francisco.

Camp Polk, Louisiana, Col. Jackson B. Dismukes, a recent graduate of the Hospital Administration Course, Northwestern University, Chicago.

Camp Chaffee, Arkansas, Col. Roary A. Murchison, from Army and Navy General Hospital, Hot Springs, Ark.

Camp McCoy, Wisconsin, Col. Samuel Cohen, from Station Hospital, Fort Jackson, South Carolina.

Camp Atterbury, Indiana, Col. Howard W. Doan, from Fitzsimons Army Hospital, Denver.

Fort Leonard Wood, Missouri, Col. Clifford A. Best, from William Beaumont Army Hospital, Fort Bliss, Texas.

Camp Roberts, California, Col. George Horsfall, from Seattle Port of Embarkation, Seattle.

Camp Cooke, California, Col. William A. Woolgar, from Fort Worden, Washington.

Awards and Commendations

DR. JOHN S. ARNOLD

Capt. John S. Arnold, Medical Corps, of the 43rd Infantry Division, U. S. Army, now in private practice in Oakland, Calif., has been awarded the Silver Star Medal. The citation reads in part as follows:

"For gallantry in action against the enemy on Hill 900, in the vicinity of Rosario, Luzon, Philippine Islands on 22 January 1945. While an infantry battalion was occupying Hill 900, a Jap counterattack, preceded by a kneemortar barrage, inflicted numerous casualties to our men. Captain Arnold, at the risk of his own life, moved from foxhole to foxhole in the darkness through enemy fire, dressing wounds and administering blood plasma with the aid of a flashlight. During the ensuing attack the enemy succeeded in overrunning our outer perimeter defense positions with a considerable force and created a havoc until driven back by reinforcements. Captain Arnold continued treating the wounded throughout the attack, and later brought two critically wounded soldiers into his foxhole, remained with them all night working with meticulous skill to keep them alive until they could be evacuated the next morning."

Public Health Service

Meetings of Study Sections

The 18 study sections of the National Institutes of Health will meet during September and early October. These sections consist of outstanding authorities in each of the major fields of medical research. They review applications for research grants and make recommendations to the advisory councils of the Public Health Service. They are also responsible for surveying the status of research in their fields to determine areas in which research should be initiated or expanded. All but one of the study sections will meet at the National Institutes of Health or in Washington, D. C. The Environmental Health Study Section will meet in Cincinnati.

Course in Diagnosis of Enteric Diseases

A three week course in laboratory diagnosis of enteric diseases will be given in October by the Laboratory Division of the Communicable Disease Center. The training program will be conducted at the Center's Bacteriology Laboratories in Chamblee, Ga. Part 1, to be held October 9-13, emphasizes the biochemical tests for delineation of members of the several genera of enteric bacteria and the serological grouping of the bacteria into their respective genera through the use of polyvalent serums. Part 2, to be held October 16-27, includes serological study of various micro-organisms, with unabsorbed and absorbed typing fluids. Employees of state and local public health department laboratories are given first consideration, but applicants from hospitals and nonprofit laboratories are eligible when vacancies exist. Applicants must have approval for the training from their state health officer. There is no tuition charge or laboratory fee, but travel and living expenses must be arranged and paid by the individual or his employer. Information may be obtained from the Laboratory Division, Communicable Disease Center, 291 Peachtree Street, N.E., Atlanta, Georgia.

Mission to Indo-China

Drs. Lewis C. Robbins and Andrew W. Para, Public Health Service officers, have left for Indo-China to join other Service personnel assigned to the Health Division of the ECA Special Technical and Economic Mission to the Associated States of Indo-China. Dr. Robbins will head the Health Division to relieve Dr. John Grant, acting chief, who has been on loan to the Health Division of the Mission from the Rockefeller Foundation. About $23,500,000 has been allocated to all types of economic aid for Indo-China this year and about six million dollars of this will be used for public health projects. Medical assistance that is planned includes teams to combat malaria, tuberculosis, venereal disease, trachoma and diseases affecting maternal and child health.

MEDICAL NEWS

(Physicians will confer a favor by sending for this department items of news of general interest: such as relate to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.)

COLORADO

Denver Cancer Clinic.—Through the Denver County Medical Society, the Colorado Division of the American Cancer Society and six participating Denver hospitals have set up a clinic for the detection and treatment of cancer. It will be named for the late Harry H. Field, whose wife was a victim of cancer. As an outpatient clinic, it will serve toward early detection of the disease and will offer roentgen therapy and surgical treatment by experienced personnel. Hospitals participating are Mercy, St. Luke's, St. Anthony, Presbyterian, Childrens and St. Joseph's.

DISTRICT OF COLUMBIA

University Promotions.—George Washington University School of Medicine has announced the promotion of three associate professors to professors of their departments: Dr. Thomas M. Peery, pathology; Dr. William W. Stanbro, radiology, and Dr. Charles S. Wise, physical medicine. Dr. Charles S. Coakley has been named associate professor of anesthesiology; Dr. William S. McCune, an associate clinical professor of surgery, and Dr. George Nordlinger, an associate clinical professor of obstetrics and gynecology.

FLORIDA

Hospital News.—Ground was broken July 12 for a 251 bed city hospital in St. Petersburg. It is expected to be completed in about 18 months at a cost of $3,000,000. A city landmark will disappear with the appearance of the hospital. It is an Indian shell mound, believed to date back beyond the days of the Spanish explorers.

ILLINOIS

Arthritis Foundation Fellowship.—The Illinois Chapter of the Arthritis and Rheumatism Foundation is offering a fellowship for research in the basic sciences related to the study of arthritis. This fellowship carries a stipend of $4,000 to $6,000, depending on the needs and ability of the worker, for a period of one year beginning in July 1951, although an earlier appointment would be considered by the committee. Applications should be sent to the Illinois Chapter, Arthritis and Rheumatism Foundation, 69 West Washington Street, Chicago 2, by Jan. 1, 1951. Notification of the fellowship granted will be made March 1, 1951. If any applications are received by Sept. 15, 1950, they will be acted on at that time and notification made immediately.

Chicago

Welfare Council Director to Retire.—Mr. Wilfred S. Reynolds, executive director of the Welfare Council of Metropolitan Chicago, after 33 years of service to the organization, will retire December 31. He was one of the founders of the Welfare Council of Chicago in 1917, then known as the Council of Social Agencies. Under his leadership it developed as a central planning organization composed of 25 health and welfare agencies in Chicago to its present membership of 250 public and private agencies in the metropolitan area.

Illinois Promotions.—Promotion of Drs. Carroll L. Birch, Ford K. Hick, Paul H. Holinger, Ladislas J. Meduna and Klaus R. Unna from associate professors to full professors in the University of Illinois College of Medicine has been announced. Dr. Birch, a member of the faculty of the department of medicine since 1926, has specialized in blood diseases and tropical medicine. She spent six months in England and other Eruopean countries in 1936 for the study of hemophilia and six months in Africa last year for the study of African sleeping sickness and other tropical diseases. Dr. Hick, an internist and member of the faculty since 1931, served in the U. S. Army for five years during the last war. His principal research interests have concerned the reaction of circulation to different environmental temperatures. Dr. Holinger's work has been in the fields of bronchoesophagology and laryngeal surgery. He has been a member of the faculty since 1933. Dr. Meduna has been an associate professor of psychiatry since he joined the faculty in 1943. He received his M.D. degree from the Royal University of Sciences, Petrus Pazman, at Budapest, Hungary. Dr. Unna joined the faculty in 1945 as an assistant professor of pharmacology. He received his M.D. degree at the University of Freiburg, Germany, in 1930.

INDIANA

Medical Aspects of Atomic Warfare.—Indiana physicians learned about the medical aspects of atomic bombing at an all-day meeting at Indiana University Medical Center, Indianapolis, on August 16. Dr. John A. Campbell, radiologist at the medical center, was among the speakers. A motion picture, "Medical Effects of the Atomic Bomb," was shown. The Indiana State Medical Association and the Indiana University School of Medicine sponsored the meeting.

Thurman B. Rice Auditorium.—The auditorium in the new two million dollar State Board of Health Building, 1330 West Michigan Street, Indianapolis, is to be known as the "Thurman B. Rice Auditorium," in honor of Dr. Thurman B. Rice, chairman and professor of public health, Indiana University School of Medicine. Dr. Rice has been associated with the university for many years. Prior to opening the school of public health in 1947 he had been teaching public health and preventive medicine at the university and had been head of the department of bacteriology and public health. He has been editor of the State Board of Health *Monthly Bulletin* since 1933 and was acting state health commissioner in 1942.

Personals.—Dr. John D. Van Nuys, dean of the University of Indiana School of Medicine, Indianapolis, has received the first annual award of merit of the Indiana Public Health Association for outstanding service in the field of public health during the last year.——Dr. E. Bryan Quarles, Washington, D. C., who has been serving with the Veterans Administration, has been appointed director of the Student Health Service at Indiana University, Bloomington. The health service, which is responsible for the emergency care of about 12,000 students, maintains an infirmary of 100 beds.——Dr. H. Glenn Gardiner, Chicago, on July 1 assumed duties as assistant medical director of the Inland Steel Company, Indiana Harbor Works, East Chicago, Ind.

MICHIGAN

Personal.—Dr. John A. Wessinger, Ann Arbor, on July 1 retired as city health officer, a position he is reported to have held for 45 years. The city council passed a special resolution thanking Dr. Wessinger for his "loyal and intense effort to the advancement of municipal administration" as well as "long years of faithful and devoted service in municipal public health administration." Dr. Wessinger was 89 years old on his retirement.

Michigan Medical Alumni Reunion.—The Centennial reunion and fourth triennial of the University of Michigan Medical Alumni will be held September 28-30 in Ann Arbor. A symposium on pituitary adrenocorticotropic hormone ACTH, cortisone and adrenal steroids will be held in the morning of September 28 and a symposium on tuberculosis in the afternoon. The following morning clinical conferences will be held at University Hospital, and six papers will be presented in the afternoon. For further information address Dean A. C. Furstenberg, Medical School, Ann Arbor.

MINNESOTA

Cancer Teaching Clinic.—An afternoon cancer teaching clinic will be held at St. Mary's Hospital, Duluth, October 18, sponsored by the state medical societies of Minnesota and Wisconsin, the Minnesota and Wisconsin divisions of the American Cancer Society and both state boards of health. There is no registration fee. The program is furnished through the state division of the American Cancer Society. Speakers will be:

John R. McDonald, Rochester, Cytological Diagnosis of Malignancies.
Carl W. Eberbach, Milwaukee, Office Diagnosis of Malignancies.
Richard L. Varco, Minneapolis, The Problem of Carcinoma of the Lung.

There will be a general symposium and question and answer period at the close of the presentation of papers. At the dinner meeting at the Gitchie Gammi Club Dr. Alexander Brunschwig, New York, will speak on "Radical Surgery in Advanced Cancer of the Female Genital Tract."

NEBRASKA

University Appointment.—Dr. Cecil L. Wittson has been appointed professor of neurology and psychiatry at the University of Nebraska College of Medicine, Omaha. Dr. Wittson was at Central Islip State Hospital for a number of years, and during the late war was senior consultant with the U. S. Naval Reserve. He will become the director of the Nebraska Psychiatric Unit, a joint venture of the Board of Control of the State of Nebraska and the Board of Regents which is designed as a teaching unit to the college of medicine and school of nursing.

NEW JERSEY

County to Survey the Chronically Ill.—The health and welfare agencies together with the assistance of the Women's Auxiliary to the Passaic County Medical Society have undertaken a county wide survey of the care and rehabilitation of the chronically ill. Each doctor in the county, hospital auxiliaries and health and welfare agencies will be contacted. It is anticipated that all private patients, clinical and ward patients as well as persons known to social agencies will be fully covered. All persons known to be suffering with a crippling disease that results in illness lasting three months or longer will be included in the survey. Broad diagnoses will be requested in the questionnaire being used, and a classification of bedridden or ambulatory patients with a temporary or progressive type of illness will be attempted. An effort will be made to determine whether a chronically ill person is financially able to meet the cost of his care and whether he can remain at home or with relatives. When the survey is completed in the late fall, the Health and Welfare Hospital Division of the Council Committee of the United Community Chest and Council, Inc., expects to have sufficient factual data for recommending a well rounded program for care and rehabilitation of the chronically ill in the county. Dr. Joseph E. Mott, Paterson, chairman of the division and editor of the *Bulletin of the Passaic County Medical Society*, is chairman of the survey.

NEW MEXICO

Committee Report on State Hosiptal.—The New Mexico Medical Society in February appointed a committee to investigate charges of mismanagement at state institutions (THE JOURNAL, April 8, page 1086). The committee's report at the meeting of the state association in May revealed that the hospital employees were attempting to do a good job under serious handicaps: deficiencies in physical plant and its equipment, lack of sufficient technically trained personnel and insufficient appropriation allotted by the legislature. Recommendations were made for obtaining an accredited class A mental disease hospital for the state. The report concluded that existing conditions at the New Mexico State Hospital had been exaggerated and distorted by persons whose motives are suspect.

NEW YORK

Public Health Appointment.—The State Health Department announced the provisional appointment August 16 of Dr. Stephen C. F. Mahady, Albany, as hospital medical management advisor, assigned to the Bureau of Tuberculosis Hospitals, Division of Tuberculosis Control. His responsibilities are related to the tuberculosis hospital program of the state, particularly with respect to local tuberculosis hospitals and state aid reimbursement. He comes to the department from Firland Sanatorium in Seattle, Wash. He has been serving also as clinical instructor in medicine at the University of Washington School of Medicine.

New York City

Veteran Medical Teacher to Retire.—After completing 35 years of teaching, Dr. Walter T. Dannreuther will retire as professor and chairman of the department of obstetrics and gynecology of the New York University Post-Graduate Medical School, a unit of the New York University-Bellevue Medical Center. Dr. Dannreuther was first appointed to the staff of University Hospital (then New York Post-Graduate Hospital) in 1914 and has taught at that institution continuously since that time and since its merger with the New York University-Bellevue Medical Center in November 1948. Dr. Dannreuther will be appointed professor emeritus of obstetrics and gynecology at the close of the current academic year and will continue all his other professional activities. Many honors came to Dr. Dannreuther during his teaching career. In 1932 he was elected to the presidency of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons; in 1942 he was chairman of the Section on Obstetrics and Gynecology of the American Medical Association; in 1925 he was made president of the New York Medico-Surgical Society and in 1934 president of the Medical Society of the County of New York. He is a member of the board of governors of the American College of Surgeons and was reelected president of the American Board of Obstetrics and Gynecology in May of this year for the twenty-first time.

Graduate Fortnight.—The twenty-third Graduate Fortnight of the New York Academy of Medicine will be held October 9-20 at the academy building. The program includes morning panel discussions, afternoon hospital clinics, evening addresses and scientific exhibits and demonstrations on the musculoskeletal system. Visiting speakers include:

Jerome Gross, Boston, Ludwig Kast Lecture, Structure and Function of Connective Tissue.
Joseph L. Lilienthal Jr., Baltimore, On Certain Aspects of the Physiology of Muscle.
Donald S. McEachern, Montreal, Canada, Diseases and Disorders of Muscle Function.
John E. Howard, Baltimore, Metabolism of Calcium and Phosphorus in Bone.
Marcy L. Sussman, Los Angeles, Skeletal Changes Associated with Diseases of the Blood.
Cyril N. H. Long, New Haven, Conn., Pituitary-Adrenal Relationshps.
John S. L. Browne, Montreal, Canada, Physiological Effects of Cortisone and ACTH.
Walter Bauer, Boston, Degenerative Diseases of the Joints.
G. Lyman Duff, Montreal, Canada, The "Collagen Diseases."
Arthur Steindler, Iowa City, Arthritis of Known Microbial Cause, Exclusive of Tuberculous Arthritis.
Davis M. Bosworth, New York, Tuberculous Involvement of Bones and Joints.
C. Howard Hatcher, Chicago, Role of Aseptic Necrosis of Bone in Skeletal Disease and Injuries.

TEXAS

Society News.—Dr. Joseph B. Kirsner, Chicago, will speak on "Recent Therapeutic Advances in Gastrointestinal Disorders" before the Dallas County Medical Society September 12, when it meets in the Baylor University Hospital Auditorium in Dallas at 8:00 p. m.

Medical Association Executive Secretary.—The State Medical Association of Texas has appointed G. Todd Bates, Chicago, as executive secretary, succeeding Dr. Harold M. Williams, who resigned June 1. Mr. Bates, a native Texan, had for nearly a year been on the staff of Whitaker and Baxter, public relations consultants, working on the American Medical Association National Education Campaign.

VIRGINIA

McIntire Tumor Clinic.—This clinic at the University of Virginia Hospital, Charlottesville, was made possible by an endowment fund of $100,000 given by Paul Goodloe McIntire, a native of Charlottesville, now of New York. The clinic is a memorial to his second wife, who died of cancer. The clinic staff director is Dr. H. Rowland Pearsall.

Personals.—The Medical College of Virginia, Richmond, at its commencement exercises on June 6 awarded its first Master of Science degree in general medicine to Dr. James D. Hagood, Clover. The degree is being given by the college as a means of recognition in the field of general medicine.——Dr. A. Stephens Graham, associate professor of surgery, Medical College of Virginia, Richmond, went to Panama on July 20 as an Army Medical Department consultant. He spent about ten days consulting with Army surgeons in the Canal Zone.

State Medical Meeting at Roanoke.—The Medical Society of Virginia will hold its annual meeting at the Hotel Roanoke in Roanoke October 8-11, under the presidency of Dr. Walter C. Caudill, Pearisburg. Out of state speakers include:

John G. Rennie, Huntington, W. Va., Subphrenic Vagotomy vs. Gastrectomy.
Colonel William L. Wilson, Washington, D. C., Civilian Defense.
Claude C. Coleman Jr., Ralph A. Deterling Jr. and Mary S. Parshley, Ph.D., New York, Experimental Studies with Preserved Aortic Grafts.
Franklin D. Murphy, Kansas City, Kan., Postgraduate Education for the Practicing Physician.
George T. Pack, New York, Cancer of the Colon and Rectum.

The dinner will be held Tuesday evening.

WEST VIRGINIA

Society News.—The West Virginia Heart Association has opened offices at 1013 Quarrier Street in Charleston, with Mrs. Caroline R. Rainbolt as executive secretary. Dr. John E. Stone of Huntington is president of the association, and the other officers are Dr. Lawrence B. Gang of Huntington, vice president; William Richmond of Beckley, secretary, and Dr. Wade H. Rardin of Beckley, treasurer.

Practice of Medicine by Hospitals.—Recently the Office of the Attorney General of West Virginia was asked by the state director of health for an opinion as to the legality of enumerated practices engaged in by certain hospitals in the state. On July 11 the attorney general submitted his opinion,

which concluded with this paragraph: "It is therefore our opinion that a hospital which employs a licensed physician on a salary and includes medical services performed by him as an item of expense on bills to its patients, and necessarily controls his discretion even if only in a general way as to the patients he shall treat and the method of treatment, is engaged in the unauthorized practice of medicine within the meaning of that term as defined by law in this state." This opinion is consistent with the decision of a trial court in West Virginia, rendered January 29, 1938, *Andrew E. Smick et al.* v. *Staats Hospital*, Circuit Court of Kanawha County. A comment on the court decision was published in THE JOURNAL of May 14, 1938, beginning on page 206 B. While the facts in the Staats case differ somewhat from those presented to the attorney general by the state director of health, the fundamental conclusions reached in the case and by the attorney general are similar.

WISCONSIN

Public Health Appointment.—Dr. E. Maxine Bennett, a member of the faculty of the University of Wisconsin Medical School, Madison, has been appointed to the newly created post of medical specialist in the Bureau for Handicapped Children, state department of public instruction. She will interpret good medical practices to educators and will explain the work of educators in health to the medical profession. She is the first physician to be employed by the department. Dr. Bennett will continue her work as part time teacher in the department of otolaryngology at the medical school.

GENERAL

Pan American Conference on Leprosy.—Dr. Carlos F. Guillot, secretary of the executive committee of the Third Pan American Conference on Leprosy, has reported that the conference, scheduled to be held in Buenos Aires, October 8-14, has been postponed until next year.

Muscular Dystrophy Research Foundation.—This foundation was chartered by the State of Texas March 20 to raise funds for research in the cause and treatment of muscular dystrophy, to arouse more interest and help within the medical profession and to inform the public of the disease. The president is Dr. Albert L. Delaney, Liberty, Texas, and the executive secretaries are Sallie and Nadine Woods, of Liberty. The address is P. O. Box 384, Liberty, Texas.

Communicable Disease Report.—According to the U. S. Public Health Service, the total number of cases of infectious encephalitis reported for the week ended August 19 was 21, compared with 14 reported for the corresponding period last year. For the calendar year a total of 516 cases was reported, the highest total in the past five years. One case of smallpox was reported in Kansas. The New Mexico State Health Department confirms a laboratory report indicating bubonic plague in a 14 year old girl, presumably an Arizona patient. A report of the case had not yet been received.

Society Elections.—The Society for Vascular Surgery at its annual meeting at San Francisco in June elected the following members to office: Dr. Ross Veal, Washington, president; Dr. Mims Gage, New Orleans, vice president; Dr. Harris B. Shumacker Jr., Indianapolis, treasurer, and Dr. George D. Lilly, Miami, Fla., secretary.——The newly elected officers of the New England Roentgen Ray Society for the ensuing year are Dr. George Levene, Boston, president; Dr. Jack Spencer, Portland, Maine, vice president; Dr. Joseph H. Marks, Boston, treasurer, and Dr. Laurence L. Robbins, Boston, secretary. The society meets on the third Friday of each month, October through May.

Meeting on Child Safety.—The American Academy of Pediatrics and the National Safety Council will hold a joint meeting October 17 at 8:00 p. m. in the Grand Ballroom of the Palmer House, Chicago, to discuss methods of preventing accidents among children. The objectives of this meeting are (1) to focus national attention on the importance of child safety, (2) to develop methods whereby the medical profession and other safety interests can mutually aid in reducing the high accident toll among children and (3) to stimulate research in the cause and prevention of child accidents. With the conquest of communicable diseases of children accidents now represent the leading cause of death and an outstanding cause of disablement and other injuries among children from ages 1 to 14. The highest rates are in the preschool age. Most of the accidents occur in and around the home. In an average year accidents result in the death of more than 5,000 preschool children between the ages of 1 and 4. This is greater than the annual number of deaths from diphtheria in this age group nearly a quarter of a century ago, when this disease was considered an outstanding cause of child deaths.

Section Meetings on Urology.—The Northeastern Section of the American Urological Association will meet at the Lake George Sagamore, Bolton Landing, N. Y., September 14-16. Those speaking by invitation include:

William W. Scott, Baltimore, Geriatrics with Special Reference to Urological Problems.
Thomas D. Moore, Memphis, Tenn., Some Renal Neoplasms of Unusual Interest.
Howard J. Barrie, Toronto, Canada, The Intrinsic Muscles of the Kidney and Some Circulatory Mechanisms of the Arcuate Line.
George F. Cahill, New York, Surgery of Testicular Tumors.

The South Central Section of the association will meet at the Mayo Hotel, Tulsa, Okla., September 25-27. Dr. Samuel A. Vest, Charlottesville, Va., the honor guest speaker, on Tuesday will give an address on "The Treatment of Acute Renal Failure." Dr. Rubin Flocks, of the State University of Iowa, Iowa City, will speak by invitation on "Conservative Treatment of Carcinoma of the Prostate."

Meeting on Dietetics.—The American Dietetic Association will hold its thirty-third annual meeting in Washington, D. C., October 16-20. Some of the speakers and their subjects are as follows: Dr. Winthrop M. Phelps, medical director of the Children's Rehabilitation Institute, Baltimore, "Diet Requirements in Cerebral Palsy"; Dr. O. Spurgeon English, professor and head of the department of psychiatry at Temple University School of Medicine and Hospital, Philadelphia, "Psychosomatic Medicine and Dietetics"; Dr. John R. McGibony, chief, Division of Medical and Hospital Resources, U. S. Public Health Service, "Forecast—Fair: The Outlook for Better Hospital Service"; Dr. William S. Schram, Veterans Administration, Newark, N. J., "The Doctor and the Dietitian as a Team in Treating Paraplegics," and C. Glen King, Ph.D., scientific director of the Nutrition Foundation, Inc., New York, "Current Research in Nutrition." A number of sessions will be devoted to subjects concerning food technology, institution management and professional education.

Southwestern Surgical Congress.—The second annual meeting of this congress will be held September 25-27 at the Shirley Savoy Hotel, Denver, under the presidency of Dr. Thomas G. Orr Jr., Kansas City, Kan. Speakers outside the section include:

Harwell Wilson, Memphis, Tenn., Surgical Treatment of Stricture of the Common Bile Duct.
Robert W. Buxton, Ann Arbor, Mich., Postphlebitic Extremity — Present Management.
Richard W. Te Linde, Baltimore, Pelvic Endometriosis, Clinical and Experimental.
Julian A. Moore, Asheville, N. C., Spontaneous Rupture of the Spleen: Report of Three Cases.
Thomas J. Kinsella, Minneapolis, Spontaneous Rupture of the Esophagus.
Arnold S. Jackson, Madison, Wis., Tumors and Cysts of the Neck.
James D. Rives, New Orleans, Complications of Thyroidectomy with Special Reference to Thyroid Crises: Review of 400 Consecutive Cases.

At the annual banquet Tuesday at 7:00 p. m., Walter O. Roberts, Ph.D., professor of astronomy and astronomical physics, Harvard University, Boston, will speak on "Significance of Sun Spots."

Fulbright Exchange Program.—The Fulbright Act, passed by Congress in 1946 as an amendment to the Surplus Property Act of 1944, provides that some of the foreign currencies and credits which accrued to the United States through the sale of surplus property abroad be used to defray costs of formal education of American citizens in universities and colleges abroad. Funds for graduate study include expenses for transportation, tuition and maintenance. For teaching and research they include stipend, maintenance, educational materials, incidental expenses and travel. Physicians and students who may be interested in the graduate study features of the program should apply to the Fulbright Program Advisors on their campuses. Others should apply directly to the Institute of International Education, 2 West 45th Street, New York 19. Those interested in university teaching, lecturing or advanced research should address the Conference Board of Associated Research Council, 2101 Constitution Avenue N. W., Washington 25, D. C. Grants are usually made for a period of one academic year with the possibility of renewal for an additional year. Awards are not made for students to attend summer courses abroad.

Regional Industrial Health Conference.—October 12-14 are the dates set for the third annual Gulf Coast Regional Conference on Industrial Health at the Rice Hotel in Houston. Primarily the conference is being planned for the benefit of representatives of the medical profession, industrial nurses, safety engineers, public health departments, insurance companies and utility, sanitary and chemical engineers. Representatives of labor and management will also profit from many of the discussions of current industrial problems. The keynote address will be given by Dr. Robert A. Kehoe, director, Kettering Laboratory for Applied Physiology, Cincinnati. The panel

on "Teamwork in Industrial Health" will be presented Thursday evening, with Robert L. Sutherland, Ph.D., director of the Hogg Foundation for Mental Hygiene, Austin, Texas, as moderator. Speakers on the panel will be Dr. Irving R. Tabershaw, Liberty Mutual Insurance Companies, New York; J. J. Bloomfield, U. S. Public Health Service, Washington, D. C.; Mrs. Mary E. Delehanty, R. N., president, American Association of Industrial Nurses, New York, and Harry Read, Congress of Industrial Organizations, Washington, D. C. Another panel will be presented Friday morning on "The Evaluation of the Degree of the Physically Handicapped Employee and His Employment" with L. H. Flewellen of the Texas State Industrial Accident Board, Austin, serving as chairman. Speakers will be Dr. Theodore M. Frank, Pan American Refining Corporation, Texas City; Dr. Hardy A. Kemp, Baylor University College of Medicine, Houston, and a management representative. The Friday afternoon discussion will be a symposium on "Atmospheric Contamination and Industrial Wastes," with Dr. Frederick G. Sawyer, director, Stanford Research Institute, Stanford, Calif., as moderator. The speakers will be H. H. Schrenk, Ph.D., Industrial Hygiene Foundation of America, Inc., Pittsburgh; John N. Abersold, Ph.D., American Smelting & Refining Company, Salt Lake City; Dr. Tabershaw, New York, and Dr. Bloomfield, and W. B. Hart, Atlantic Refining Company, Philadelphia.

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the periods indicated have been received from the National Office of Vital Statistics, U. S. Public Health Service.

	Week Ended		Total*		5-Year
	Aug. 26, 1950	Aug. 27, 1949	1950	1949	Median, 1945-1949
United States Total	1,617	3,241	10,712	19,616	10,187
New England States:					
Maine	1	44	22	224	15
New Hampshire	3	32	5	89	15
Vermont	3	10	11	40	13
Massachusetts	19	194	100	737	83
Rhode Island	1	15	12	50	13
Connecticut	33	70	117	232	52
Middle Atlantic States:					
New York	184	573	950	2,555	464
New Jersey	53	122	257	530	258
Pennsylvania	77	65	328	259	238
East North Central States:					
Ohio	86	123	347	715	261
Indiana	23	58	122	614	102
Illinois	113	276	546	1,506	351
Michigan	95	277	417	1,271	215
Wisconsin	63	81	189	401	151
West North Central States:					
Minnesota	27	183	140	872	359
Iowa	54	134	400	608	245
Missouri	7	116	132	806	106
North Dakota	5	50	21	285	44
South Dakota	7	25	46	144	72
Nebraska	22	51	108	243	212
Kansas	33	33	102	369	107
South Atlantic States:					
Delaware	2	4	14	27	27
Maryland	33	16	119	65	37
District of Columbia	10	7	85	40	40
Virginia	67	34	548	153	153
West Virginia	35	18	148	196	34
North Carolina	65	13	320	124	56
South Carolina	27	10	265	52	52
Georgia	23	15	138	101	83
Florida	9	6	142	120	120
East South Central States:					
Kentucky	36	33	293	285	64
Tennessee	35	31	232	297	175
Alabama	15	12	171	133	106
Mississippi	23	19	194	203	77
West South Central States:					
Arkansas	14	50	156	702	84
Louisiana	17	10	190	133	69
Oklahoma	22	62	292	814	213
Texas	113	69	1,628	1,515	665
Mountain States:					
Montana	6	2	17	24	18
Idaho	2	33	28	256	54
Wyoming	2	9	27	61	54
Colorado	9	53	74	271	42
New Mexico	4	14	40	91	43
Arizona	6	13	51	84	60
Utah	3	12	20	75	38
Nevada	2	..	3	10	3
Pacific States:					
Washington	34	48	136	213	95
Oregon	15	15	118	81	42
California	80	101	733	940	786

* Beginning with the 12th week of each year.

Coming Medical Meetings

American Academy of Ophthalmology and Otolaryngology, Palmer House, Chicago, Oct. 8-13. Dr. W. L. Benedict, 100 First Avenue Bldg., Rochester, Minn., Secretary.

American Academy of Pediatrics, Palmer House, Chicago, Oct. 16-19. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Association of Blood Banks, Stevens Hotel, Chicago, Oct. 12-14. Miss Marjorie Saunders, 3301 Junius, Dallas 1, Texas, Secretary.

American Association of Medical Record Librarians, Somerset Hotel, Boston, Oct. 23-27. Miss Martha M. Bailer, 18 E. Division St., Chicago 10, Executive Secretary.

American Clinical and Climatological Association, Red Lion Inn, Stockbridge, Mass., Oct. 17-19. Dr. James Bordley III, Mary Imogene Bassett Hospital, Cooperstown, N. Y., Secretary.

American College of Surgeons, Boston, Oct. 23-27. Dr. Paul B. Magnuson, 40 E. Erie St., Chicago 11, Secretary.

American Hospital Association, Atlantic City, Sept. 18-22. Mr. George Bugbee, 18 E. Division St., Chicago 10, Executive Director.

American Public Health Association, Hotels Statler and Jefferson, St. Louis, Oct. 30-Nov. 3. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, Executive Secretary.

American Society of Clinical Pathologists, Drake Hotel, Chicago, Oct. 17-21. Dr. Clyde G. Culbertson, 1040 W. Michigan St., Indianapolis 7, Secretary.

American Society of Maxillofacial Surgeons, New York, Sept. 24-27. Dr. Casper M. Epsteen, 25 E. Washington St., Chicago 2, Secretary.

Association of American Medical Colleges, Lake Placid, N. Y., Oct. 22-25. Dr. Dean F. Smiley, 185 N. Wabash Ave., Chicago, Secretary.

Association of Life Insurance Medical Directors of America, New York, Oct. 19-20. Dr. Henry B. Kirkland, P. O. Box 594, Newark 1, N. J., Secretary.

Association of State and Territorial Health Officers, Washington, D. C., Oct. 23-27. Dr. Leroy E. Burney, 1089 W. Michigan St., Indianapolis 7, Secretary.

Biological Photographic Association, Hotel Sheraton, Chicago, Sept. 6-8. Mr. Lloyd E. Varden, Pavelle Color, Inc., 533 W. 57th St., New York City 19, Secretary.

Colorado State Medical Society, Broadmoor Hotel, Colorado Springs, Sept. 20-23. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.

Delaware, Medical Society of, Dover, Oct. 2-4. Dr. Andrew H. Gehret, 1007 Park Place, Wilmington, Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 2-4. Mr. Theodore Wiprud, 1718 M Street N.W., Washington 6, Secretary.

Indiana State Medical Association, French Lick, Sept. 25-27. Mr. Ray E. Smith, 23 E. Ohio St., Indianapolis 4, Executive Secretary.

International College of Surgeons, United States Chapter, Cleveland Hotel, Cleveland, Oct. 30-Nov. 3. Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago, Executive Secretary.

Kentucky State Medical Association, Brown Hotel, Louisville, Sept. 26-28. Dr. Bruce Underwood, 620 S. Third St., Louisville 2, Secretary.

Michigan State Medical Society, Book-Cadillac Hotel, Detroit, Sept. 20-22. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.

Mississippi Valley Medical Society, Springfield, Ill., Sept. 27-29. Dr. Harold Swanberg, 510 Maine St., Quincy Ill., Secretary.

National Gastroenterological Association, Hotel Statler, New York, Oct. 9-11. Dr. Sigurd W. Johnsen, 1818 Broadway, New York 23, Secretary.

Neurosurgical Society of America, Sea Island, Ga., Sept. 13-17. Dr. C. D. Hawkes, 22 N. Manassas St., Memphis, Tenn., Secretary.

Nevada State Medical Association, Las Vegas, Oct. 5-7. Dr. Wesley W. Hall, 307 West Sixth St., Reno, Secretary.

New Hampshire Medical Society, Mt. Washington Hotel, Bretton Woods, Sept. 10-12. Dr. Deering G. Smith, 44 Chester St., Nashua, Secretary.

Oregon State Medical Society, Gearhart, Sept. 27-29. Dr. Werner E. Zeller, Medical-Dental Bldg., Portland 5, Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Oct. 15-19. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Southwestern Medical Association, Hotel Westward Ho, Phoenix, Ariz., Oct. 26-28. Dr. Wickliffe R. Curtis, First National Bank Bldg., El Paso, Texas, Secretary.

Southwestern Surgical Congress, Shirley-Savoy Hotel, Denver, Colo., Sept. 25-27. Dr. C. R. Rountree, 525 N.W. Eleventh St., Oklahoma City, Secretary.

Vermont State Medical Society, Mt. Washington Hotel, Bretton Woods, N. H., Sept. 10-12. Dr. James P. Hammond, 128 Merchants Row, Rutland, Secretary.

Virginia, Medical Society of, Roanoke, Oct. 8-11. Mr. H. S. Johnson, 1200 East Clay St., Richmond 19, Executive Secretary.

Washington State Medical Association, Davenport Hotel, Spokane, Sept. 10-13. Dr. James W. Haviland, 338 White-Henry-Stuart Bldg., Seattle, Secretary.

Wisconsin, State Medical Society of, Hotel Schroeder and Milwaukee Auditorium, Milwaukee, Oct. 1-4. Mr. C. H. Crownhart, 704 E. Gorham St., Madison, Secretary.

International Meetings

International Association of Milk and Food Sanitarians, Hotel Dennis, Atlantic City, N. J., Oct. 13-16. Mr. George A. West, Rochester Health Bureau, Rochester 2, N. Y., Secretary.

International Congress on Criminology, Palais de la Sorbonne Grand Amphitheater, Paris, France, Sept. 10-19. M. Pierre Piprot d'Alleaume, 188 Ave. Victor Hugo, Paris 16e, France, General Secretary.

International Congress on Diseases of the Chest, Carlo Forlanini Institute, Rome, Italy, Sept. 17-22. Prof. A. Omodei Zorini, Carlo Forlanini Institute, Rome, Italy, Chairman.

International Congress on Internal Medicine, Paris, France, Sept. 11-14. Prof. Justin Besancon, 38 rue Barbet de Jouy, Paris, France, Secretary.

International Congress of Kenisitherapy, Paris, France, Sept. 21-24. Dr. M. René Morice, 58 bis, rue Francois ler, Paris 8e, France, Secretary.

International Congress of Psychiatry, Palais de la Sorbonne, Paris, France, Sept. 19-27. Dr. Henri Ey, 1 rue Cabanis, Paris 14e, France, General Secretary.

International Society for Internal Medicine, Paris, France, Sept. 11-15. Dr. Albert M. Snell, 102 Second Ave. S.W., Rochester, Minn., Chairman, American Committee.

Medical Women's International Association, Philadelphia, Penna., U. S. A., Sept. 10-16. Dr. Montreuil-Straus, 75 rue de l'Assomption, Paris, France, Secretary.

World Medical Association, Hotel Roosevelt, New York City, U. S. A., Oct. 16-20. Dr. Louis H. Bauer, 2 E. 103d St., New York City 29, Secretary-General.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* Chicago, Oct. 8-11. Sec., Dr. Curtiss B. Hickcox, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: *Oral.* Detroit, Oct. 20-22. Sec., Dr. George M. Lewis, 66 East 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 16. Asst. Sec., Dr. William A. Werrell, 1 West Main Street, Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, Oct. 20-21, 1950. Applications no longer accepted. Sec., Dr. W. J. German, 789 Howard Ave., New Haven, Conn.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral, including sub-specialties,* Oct. 26-28. Final date for filing application was August 19. *Oral, including sub-specialties,* Dec. 7-9. Executive Secretary-Treasurer, Dr. William A. Werrell, 1 West Main St., Madison 3.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Part I, Written Examination and Review of Case Histories. Various locations. Feb. 2, 1951. Final date for filing applications is Nov. 5. Sec., Dr. Paul Titus, 1015 Highland Building, Pittsburgh 6, Pa.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various Centers, Jan. 5-6, 1951. *Oral.* Chicago, Oct. 2-6; San Francisco, March 11-15; New York, May 31-June 4; Chicago, October 1951. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part II.* Chicago, Jan. 25-26. Final date for filing applications is Aug. 15, 1950. Sec., Dr. Harold A. Sofield, 122 South Michigan Avenue, Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-5, Jan. 8-11, 1951. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: St. Louis, Oct. 13-14. Sec., Dr. Robert R. Moore, 507 Euclid Ave., St. Louis 10.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Chicago, Oct. 13-15 and Boston, Dec. 1-3. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PLASTIC SURGERY: Houston, Nov. 30, Dec. 1-2. Sec., Dr. Bradford Cannon, 4647 Pershing Ave., St. Louis.

AMERICAN BOARD OF PREVENTIVE MEDICINE AND PUBLIC HEALTH: St. Louis, Oct. 28-29. Sec., Dr. Ernest L. Stebbins, 615 N. Wolfe St., Baltimore.

AMERICAN BOARD OF PROCTOLOGY: Philadelphia, Nov. 11-12, Part II—Anorectal Surgery. Sec.-Gen., Dr. Louis A. Buie, 102-110 Second Ave., S.W., Rochester.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 18-19. Final date for filing applications was Sept. 1. Sec., Dr. Francis J. Braceland, 102-110 Second Ave., S.W., Rochester.

AMERICAN BOARD OF RADIOLOGY: Chicago, Dec. 5-10. Quota of appointments already filled. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester.

AMERICAN BOARD OF SURGERY: *Written.* Various Centers, Oct. 25. *Written.* Various centers, March 1951. Final date for filing applications is Dec. 1, 1950. Sec., Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia.

AMERICAN BOARD OF THORACIC SURGERY: Part I. Written examination, September 22, various parts of the country. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 10-14, 1951. Final date for filing applications was Sept. 1, 1950. Sec., Dr. Harry Culver, 7935 Sunnyside Road, Minneapolis 21.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. D. G. Gill, 519 Dexter Ave., Montgomery.

ARIZONA: October 17-19. Phoenix. Sec., Dr. J. H. Patterson, 316 W. McDowell Road, Phoenix.

ARKANSAS: * Little Rock, Nov. 9-10. Sec., Dr. Joe Verser, Harrisburg. Homeopathic: Nov. Sec., Dr. C. S. Bungart, 105 N. 14th St., Ft. Smith. Eclectic: Nov. 9. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Examination Written.* Sacramento, Oct. 16-19. *Examination, Oral and Clinical for Foreign Medical School Graduates,* San Francisco, Nov. 12. *Reciprocity, Oral Examination,* San Francisco, Nov. 11. Sec., Dr. Frederick N. Scatena, 1020 N Street, Sacramento 14.

COLORADO: * Denver, Jan. 3-5, 1951. Exec. Sec., Mrs. B. M. Hudgens, 831 Republic Bldg., Denver.

CONNECTICUT: * Hartford, Nov. 14-15. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. Homeopathic: Nov. 14-15. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: Dover, Jan. 9-11. *Reciprocity.* Jan. 18, 1951. Sec., Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, Sept. 18. Sec., Dr. Daniel L. Seckinger, 4130 Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 26-28. Sec., Dr. Homer Pearson, 701 Dupont Bldg., Miami.

GEORGIA: Atlanta, Oct. 10-11. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

HAWAII: Honolulu, Jan. 8-11, 1951. Sec., Dr. I. L. Tilden, 881 S. Hotel St., Honolulu.

IDAHO: Boise, Jan. 8, 1951. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

ILLINOIS: Chicago, Oct. 10-12. Superintendent of Registration, Mr. Charles F. Kervin, Capitol Bldg., Springfield.

INDIANA: Indianapolis, June 1951. Exec. Sec., Miss Ruth V. Kirk, 1138 K. of P. Bldg., Indianapolis 4.

IOWA: *Written.* Des Moines, Dec. 4-6. Acting Director, Division of Examination and Licensure, State Department of Health, 1027 Des Moines St., Des Moines.

KANSAS: Topeka, Dec. 13-14. Sec., Dr. O. W. Davidson, 772 New Brotherhood Bldg., Kansas City.

LOUISIANA: New Orleans, Dec. 8-10. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Portland, Nov. 14-15. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Baltimore, Dec. 12-15. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore 1.

MASSACHUSETTS: Boston, Jan. 23-26, 1951. Sec., Dr. Geo. R. Schadt, 37 State House, Boston.

MINNESOTA:* Minneapolis, Oct. 17-19. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: Jackson, December. Asst. Sect., Dr. R. N. Whitfield, Jackson 113.

MISSOURI: October 19-21. Kansas City. Exec. Sec., Mr. John A. Hailey, P. O. Box 4, Jefferson City.

MONTANA: Helena, Oct. 2. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEBRASKA:* June 1951. Director, Mr. Oscar F. Humble, Room 1009, State Capitol Bldg., Lincoln.

NEVADA: Nov. 6. Carson City. Sec., Dr. George H. Ross, 112 Curry Street, Carson City.

NEW JERSEY: Trenton, Oct. 17-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, Oct. 9-10. Sec., Dr. Charles J. McGoey, Coronado Building, Santa Fe.

NEW YORK: New York, Buffalo, Albany and Syracuse, Oct. 3-6. Sec., Dr. Jacob L. Lochner, 23 S. Pearl St., Albany.

NORTH CAROLINA: *Reciprocity.* Raleigh, Sept. 25. Sec., Dr. Ivan Procter, 226 Hillsboro St., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 3-6. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: Columbus, December. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * *Examination.* Portland, January 1951. *Reciprocity.* Portland, Oct. 13. Sec., Mr. Howard I. Bobbit, 608 Failing Bldg., Portland 4.

PENNSYLVANIA: Philadelphia, January 1951. Acting Secretary, Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, Oct. 5-6. Chief, Mr. Thomas B. Casey, 355 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 13-15. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: Jan. 15-16. Sioux Falls, South Dakota. Sec., Dr. C. E. Sherwood, 300 First National Bank Bldg., Sioux Falls.

TENNESSEE: * Memphis, Sept. 27-28. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis 3.

TEXAS:* Fort Worth, November 9-11, 1950. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth.

UTAH: Salt Lake City, July 1951. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

VERMONT: Burlington, February 1951. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Nov. 30, Dec. 1-2. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

WASHINGTON: * Seattle, January 1951. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

WEST VIRGINIA: Charleston, Oct. 2-4. Sec., Dr. N. H. Dyer, State Capitol, Charleston 6.

WISCONSIN: * River Falls, Jan. 9-11, 1951. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Oct. 2. Sec., Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Sept. 19. Sec., Mr. Francis A. Roy, Science Hall, Univ. of Arizona, Tucson.

ARKANSAS: Little Rock, Oct. 3-4. Sec., Mr. L. E. Gebauer, 1002 Donaghey Bldg., Little Rock.

CONNECTICUT: Oct. 14. Executive Sec., M. G. Reynolds, State Board of Healing Arts, 110 Whitney Ave., New Haven 10.

DISTRICT OF COLUMBIA: Washington, Oct. 23-24. Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

FLORIDA: Jacksonville, Nov. 11. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

IOWA: Des Moines, Oct. 10. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MICHIGAN: *Examination.* Ann Arbor, Oct. 13-14. Sec., Miss Eloise LeBeau, 101 North Walnut Street, Lansing 15.

MINNESOTA: Minneapolis, Oct. 3-4. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: *Examination.* Omaha, Oct. 3-4. Director, Mr. Oscar F. Humble, Room 1009, State Capitol Building, Lincoln 9.

NEW MEXICO: *Examination.* Santa Fe, Sept. 17. Sec., Mrs. Marguerite K. Cantrell, Box 1522, Santa Fe.

RHODE ISLAND: *Examination.* Providence, Nov. 8. Chief, Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Building, Providence.

SOUTH DAKOTA: Vermillion, Dec. 1-2. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

TENNESSEE: Memphis, Sept. 21-22. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis 3.

TEXAS: *Examination.* Austin, Oct. 13-14, April 1951. Sec., Brother Raphael Wilson, 306 Nalle Building, Austin.

WASHINGTON: Seattle, January 1951. Sec., Mr. Edward D. Dohm, Department of Licenses, Olympia.

WISCONSIN: *Examination.* Milwaukee, Dec. 2. Sec., Mr. W. H. Barber, Scott and Watson Sts., Ripon.

DEATHS

Kulka, William Ernest, Cleveland; born in Vienna, Austria, Dec. 4, 1880; Medizinische Fakultät der Universität, Wien, Austria, 1905; pathologist of the Cuyahoga County Coroner's Office; in 1944 joined the coroner's staff in Cleveland and became head of the laboratory of pathology and forensic medicine; member of the American Medical Association, American Society of Clinical Pathologists, Ohio State Society of Pathologists, Cleveland Society of Pathologists and the Academy of Medicine of Cleveland; prior to and during World War I, served as pathologist and epidemiologist in the Imperial Austrian Army; from 1919 to 1939 maintained an extensive general practice and simultaneously was a senior health officer of Vienna; following the Nazi invasion of Austria, came to the United States and resumed his activities in the field of pathology; served as pathologist and director of the bloodbank at Our Savior's Hospital, Jacksonville, Ill.; later took charge of the laboratories of the Millard Fillmore Hospital in Buffalo; died July 19, aged 69, of acute edema of the lungs.

Douglass, Stephen Augustus, Ocala, Fla.; born in Mansfield, Ohio, Sept. 12, 1884; Starling-Ohio Medical College, 1911; member of the American College of Chest Physicians; past president of the New Jersey Tuberculosis League; formerly health officer of Cattaraugus County, N. Y.; for a short time superintendent of the Franklin County Tuberculosis Sanatorium in Columbus, Ohio; at one time medical superintendent of the Ohio State Sanatorium in Mount Vernon, Ohio, and medical director and superintendent of the Valley View Sanatorium in Paterson, N. J.; formerly superintendent of Sunnyside Sanatorium in Oaklandon, Ind.; in 1927 appointed medical field secretary of the National Tuberculosis Association; died in Munroe Memorial Hospital in July, aged 66.

Reaser, Edward Franklin ⊕ Huntington, W. Va.; born in Glenville, W. Va., Aug. 10, 1896; Medical College of Virginia, Richmond, 1930; since Aug. 1, 1947 superintendent and from 1933 to 1946 assistant superintendent of Huntington State Hospital; served as chief psychiatrist of the mental hygiene clinic at the Veterans Administration regional office; affiliated with St. Mary's and Huntington Memorial hospitals; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association, Southern Psychiatric Association and the Medical Society of St. Elizabeth's Hospital; died in Chesapeake and Ohio Hospital July 18, aged 53, of coronary thrombosis.

Bazett, Henry Cuthbert, Philadelphia; born in England in 1885, L.R.C.P. (London), M.R.C.S. (England) and F.R.C.S. (England) 1911, and University of Oxford School of Medicine, England, 1920; professor of physiology at the University of Pennsylvania School of Medicine; formerly on the faculty of the University of Toronto Faculty of Medicine, Toronto, Canada; served with British Army during World War I and received several decorations; one of the collaborators of MacLeod's "Physiology and Modern Medicine," eighth edition in 1938 and ninth edition in 1941; died July 11, aged 65, of heart disease while aboard the *SS Queen Mary* enroute to Europe.

Graves, Robert John, Concord, N. H.; born in Boscawen, N. H., June 22, 1878; Harvard Medical School, Boston, 1903; member of the American Medical Association and of its House of Delegates in 1918-1919; past president of the New Hampshire Medical Society; member of the New England Surgical Society and the American Association of Industrial Physicians and Surgeons; fellow of the American College of Surgeons; served during World War I; on the staff of the Margaret Pillsbury General Hospital; chief surgeon, Boston and Maine Railroad; medical director of the United Life and Accident Insurance Company; died July 12, aged 72, of coronary disease.

Gordon, Leon Stuart ⊕ Washington, D. C.; born in Baltimore Aug. 4, 1904; George Washington University School of Medicine, Washington, D. C., 1928; at one time assistant professor of pathology at his alma mater; certified by the National Board of Medical Examiners; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; chief of the medical staff of the Metropolitan Police Boys Clubs; medical examiner for the District of Columbia Boxing Commission; affiliated with Doctors Hospital, Garfield Memorial Hospital and Emergency Hospital, where he died July 24, aged 45, of cerebral hemorrhage.

⊕ Indicates Fellow of the American Medical Association.

Stewart, Roger Eaton ⊕ Seattle; born in Kansas City Mo., Aug. 19, 1895; Columbia University College of Physicians and Surgeons, New York, 1928; certified by the National Board of Medical Examiners; specialist certified by the American Board of Obstetrics and Gynecology; clinical instructor in obstetrics and gynecology at the University of Washington School of Medicine; at one time on the faculty of Harvard Medical School in Boston; past president of the Seattle Gynecological Society; served during World War I; affiliated with Maynard, Doctors and King County hospitals; died July 13, aged 55, of coronary disease.

Douglass, Frederick Melvin ⊕ Toledo, Ohio; born in Kalida, Ohio, 1890; Toledo Medical College, 1911; specialist certified by the American Board of Surgery; vice president of the Academy of Medicine of Toledo and Lucas County in 1936 and its president in 1937; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons; fellow of the International College of Surgeons and the American College of Surgeons; treasurer of the Toledo Medical Library, of which he was one of the founders; affiliated with St. Vincent's Hospital; died in Livingston, Mont., July 4, aged 60, of coronary disease.

Achtentuch, Herman Hersch, Passaic, N. J.; Medizinische Fakultät der Universität, Wien, Austria, 1916; member of the American Medical Association; died June 1, aged 63, of coronary thrombosis.

Ackley, Anna C., Oceanside, Calif. (licensed in Oregon in 1914 and Arkansas in 1908); died June 18, aged 79, of cerebral hemorrhage.

Alderson, Starling Peters, Miami, Fla.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; member of the American Medical Association; served as mayor of Russellville, Ky.; affiliated with Jackson Memorial Hospital; died June 29, aged 62, of coronary thrombosis.

Artin, Arsen Sissakian, Enfield, Ill.; Northwestern University Medical School, Chicago, 1899; died July 12, aged 77, of carcinoma of the pancreas.

Beach, James Daniel, Williamsport, Pa.; Jefferson Medical College of Philadelphia, 1895; member of the American Medical Association; died July 3, aged 80, of heart disease.

Butler, James Harvey, Augusta, Ga.; University of Georgia Medical Department, Augusta, 1914; associate professor of clinical medicine at his alma mater; died June 8, aged 65.

Cacciarelli, Robert Anthony ⊕ Newark, N. J.; Syracuse University College of Medicine, 1927; specialist certified by the American Board of Obstetrics and Gynecology; consulting gynecologist, American Legion Hospital; affiliated with Lutheran Memorial Hospital and Columbus Hospital, where he had been medical director and where he died July 11, aged 46, of coronary sclerosis.

Cogan, Henry ⊕ Paterson, N. J.; University and Bellevue Hospital Medical College, New York, 1907; an Associate Fellow of the American Medical Association; served on the staff of Paterson General Hospital; died in Daytona Beach, Fla., July 16, aged 83, of cardiac infarction.

Conger, Elizabeth S., Indianapolis; Medical College of Indiana, Indianapolis, 1897; member of the American Medical Association; died in Methodist Hospital, July 5, aged 76.

Davis, Elmer E., Paducah, Ky.; St. Louis College of Physicians and Surgeons, 1898; died June 17, aged 73, of cerebral hemorrhage.

Dickey, Edward W., Hazel Green, Ala.; Chattanooga (Tenn.) Medical College, 1897; member of the American Medical Association; died June 28, aged 79.

Elliot, George Douglas, Fair Bluff, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1923; member of the American Medical Association; served during World War I; medical examiner for the draft board in Fair Bluff; died in the James Walker Hospital, Wilmington, June 16, aged 53, of coronary infarction.

Eve, John Edward, Hot Springs National Park, Ark.; Meharry Medical College, Nashville, Tenn., 1918; died in Freedmen's Hospital in Washington, D. C., June 9, aged 56.

Ewalt, George Latrobe, Baltimore; University of Maryland School of Medicine, Baltimore, 1900; died July 14, aged 75.

Fife, Samuel John Sutton ✦ Bridgeville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1893; died July 18, aged 80.

Fischel, Walter ✦ St. Louis; Washington University School of Medicine, St. Louis, 1905; associate professor emeritus of clinical medicine at his alma mater; specialist certified by the American Board of Internal Medicine; served during World War I; affiliated with St. Luke's Hospital, Barnard Free Skin and Cancer Hospital, and Barnes Hospital; died July 22, aged 69, of coronary thrombosis.

Flinn, George Washington, Joplin, Mo.; St. Louis University School of Medicine, 1906; formerly on the staff of State Hospital number two in St. Joseph; died July 22, aged 78, of myocarditis.

Fosler, David Wayne ✦ Indianapolis; Medical College of Indiana, Indianapolis, 1905; affiliated with Methodist Hospital, where he died July 14, aged 68, of bacterial endocarditis.

Free, Samuel Pratt, Spencer, Iowa; State University of Iowa College of Medicine, Iowa City, 1902; died July 13, aged 72, of coronary thrombosis.

Freinkel, Jacob ✦ Newark, N. J.; Universität Heidelberg Medizinische Fakultät, Baden, Germany, 1919; affiliated with Newark Beth Israel Hospital; died June 5, aged 61, of coronary thrombosis.

Gill, James Ward, Chambers, Neb.; Cotner University Medical Department, Lincoln, 1912; member of the American Medical Association; died in Lutheran Hospital, Norfolk, July 9, aged 69, of chronic myocarditis and diabetes mellitus.

Griggs, John Bradford, Elizabeth City, N. C.; University of Maryland School of Medicine, Baltimore, 1891; died June 19, aged 80, of heart disease.

Gross, Harry Sim, Brooklyn; McGill University Faculty of Medicine, Montreal, Canada, 1921; member of the American Medical Association; also a graduate in dentistry; on the courtesy staff of St. John's Hospital in Long Island City; affiliated with Cumberland Hospital, where he died May 18, aged 61, of acute myocardial infarction.

Hagerty, Harry John, Worcester, Mass.; Tufts College Medical School, Boston, 1910; member of the American Medical Association; veteran of the Spanish-American War; for many years school physician; affiliated with St. Vincent, Worcester City and Worcester Hahnemann hospitals; author of "Jasmine Trail"; died July 26, aged 68, of coronary occlusion.

Howard, Ralph Bowen, Benton Harbor, Mich.; Rush Medical College, Chicago, 1912; at one time secretary of the Berrien County Medical Society; member of the American Medical Association; formerly team physician for the athletic associations of the Benton Harbor schools; affiliated with St. Joseph Michigan Hospital in St. Joseph and Mercy Hospital, where he died July 16, aged 66, of cerebral thrombosis.

Keefer, Matthew Henry, Kansas City, Mo.; University Medical College of Kansas City, 1907; served during World War I; affiliated with St. Joseph Hospital, where he died July 22, aged 66, of myosarcoma with metastases.

Kefauver, Elmer C., Frederick, Md.; University of Maryland School of Medicine, Baltimore, 1891; member of the American Medical Association; for many years city and county health officer; died in Frederick Memorial Hospital July 7, aged 82.

Kessell, James Everett, Des Moines; Illinois Medical College, Chicago, 1904; member of the American Medical Association; served during World War I; examining physician for draft board no. 3 during World War II; at one time health officer at Riverton, Iowa; formerly division surgeon for the Rock Island Railway; affiliated with Mercy and Iowa Methodist hospitals; died July 9, aged 69, of cerebral hemorrhage.

Kisner, Jacob C., Albuquerque, N. Mex.; College of Physicians and Surgeons, Baltimore, 1880; died July 4, aged 96.

Korowitz, Isidore, Brooklyn; Long Island College Hospital, Brooklyn, 1915; member of the American Medical Association; affiliated with Israel Zion Hospital and Beth-El Hospital; died June 12, aged 57.

Kroeger, George Baldwin, University City, Mo.; Washington University School of Medicine, St. Louis, 1904; member of the American Medical Association; formerly practiced in St. Louis, where he served on the staffs of Christian and De Paul hospitals; died July 7, aged 75, of acute bronchitis.

Kunce, Fay Eddis, Wichita, Kan.; Loyola University School of Medicine, Chicago, 1916; member of the American Medical Association; affiliated with St. Francis Hospital; died July 16, aged 69, of coronary occlusion.

Lanning, Lewis Mixell, Washington, N. J.; the Hahnemann Medical College and Hospital, Chicago, 1892; served as mayor; died July 11, aged 92, of uremia, nephrosclerosis, arteriosclerosis and prostatic hypertrophy.

Longo, James Augustus ✦ Sheppton, Pa.; Jefferson Medical College of Philadelphia, 1912; affiliated with Hazleton (Pa.) State Hospital, St. Joseph Hospital, Hazleton, and Locust Mountain State Hospital in Shenandoah; died July 12, aged 63.

Mabry, Thomas, Holland, Ark.; University of Arkansas School of Medicine, Little Rock, 1906; member of the American Medical Association; member of the Faulkner County Selective Service Board during World War II; died in Conway (Ark.) Memorial Hospital May 30, aged 70, of coronary occlusion.

McCorkle, William Everett, Ringoes, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1927; county physician; member of the American Medical Association; died June 21, aged 48, of cerebral hemorrhage.

MacMillan, Angus E. ✦ Chehalis, Wash.; born in Sydenham, Ont., Nov. 24, 1878; Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1903; member of the American Trudeau Society; fellow of the American College of Chest Physicians; medical director and superintendent of MacMillan Sanatorium; died in Swedish Hospital, Seattle, May 13, aged 72, of multiple pulmonary septic infarcts.

Michalo, Adam Jr., Nucla, Colo.; University of Colorado School of Medicine, Denver, 1931; member of the American Medical Association; formerly affiliated with the Modern Woodmen of America Sanatorium in Woodmen; died in Colorado General Hospital, Denver, May 16, aged 44.

Nelson, Harry Everett, Gladewater, Texas; Louisiana State University School of Medicine, New Orleans, 1939; member of the American Medical Association; assistant in surgery at Tulane University of Louisiana School of Medicine, New Orleans, 1943-1944; formerly clinical instructor in surgery at Southwestern Medical College, Dallas, where he was affiliated with Baylor and St. Paul's hospitals; died May 30, aged 35.

Oldham, Ernest Whitney ✦ Coalville, Utah; Northwestern University Medical School, Chicago, 1933; member of the American Academy of General Practice; died July 8, aged 44, of sarcoma.

Ratcliffe, John Jay, Aitkin, Minn.; Rush Medical College, Chicago, 1897; member of the American Medical Association; died in the Northern Pacific Beneficial Association Hospital, St. Paul, May 29, aged 78, of cerebral arteriosclerosis and hemorrhage.

Rhees, Benjamin Rush, East Orange, N. J.; George Washington University School of Medicine, Washington, D. C., 1909; died in Washington, D. C., June 29, aged 73, of coronary sclerosis.

Sadler, Robert W., Dallas, Texas; University of Nashville (Tenn.) Medical Department, 1879; died in Baylor Hospital June 28, aged 97, of heart failure.

Scales, Seaborn Franklin, Carrollton, Ga.; Atlanta School of Medicine, 1910; member of the American Medical Association; past president of the Carroll-Douglas-Haralson Counties Medical Society; died June 24, aged 65, of heart disease.

Schaffer, William J., Chicago; Jenner Medical College, Chicago, 1906; for many years examining physician for the Chicago Park District Police Annuity and Benefit Association; member of the auxiliary staff of Alexian Brothers Hospital; affiliated with Columbus Hospital, where he died August 3, aged 73, of coronary thrombosis and cerebral emboli.

Sellers, Earl Dennis, Moulton, Iowa; Hospital College of Medicine, Louisville, Ky., 1906; member of the American Medical Association; for many years surgeon for the Wabash Railroad; died in Wabash Employes' Hospital, Moberly, Mo., June 30, aged 72, of sarcoma of the lymph nodes.

Steiner, James Calvin ✦ Willard, Ohio; Ohio State University College of Medicine, Columbus, 1923; past president of the Huron County Medical Society; affiliated with Willard Municipal Hospital; died June 30, aged 62, of coronary thrombosis.

Strozier, William Marcel, Houston, Texas; University of Texas School of Medicine, Galveston, 1906; member of the American Medical Association; assistant professor of clinical ophthalmology at Baylor University College of Medicine; affiliated with Jefferson Davis Hospital; died in St. Joseph's Infirmary June 26, aged 69, of cerebral thrombosis.

Stuart, Lewis Frank, St. Louis; Ensworth Medical College, St. Joseph, 1883; died in Kirkwood June 12, aged 97.

Young, Wade Hampton, Lexington, Ky.; University College of Medicine, Richmond, 1905; died June 14, aged 71, of heart disease.

FOREIGN LETTERS

BELGIUM

(From a Regular Correspondent)

LIÈGE, July 24, 1950.

Treatment of Hematemesis

De Toeuf, Conard, Duwe and Demol reported the results of their investigations to the Belgian Society of Surgery. They studied the problem caused by severe gastroduodenal hemorrhage in the light of recent reports and based on their experience on the university services of medicine and surgery of the Brugmann and St. Pierre hospitals. During the years 1947 to 1949, 103 cases of gastroduodenal hemorrhages were followed. These 103 cases included 70 cases of gastroduodenal ulcer, two of hemorrhagic gastritis, 13 of cirrhosis of the liver, two of cholecystitis, one each of Rendu-Osler's angiomatosis, gastric cancer and septicemia due to Koch's bacilli and 13 of undetermined cause.

The differential diagnosis is based on the history and clinical examination. In order to compensate for possible clinical insufficiencies, some authors advise radiography or emergency endoscopy. The prognosis depends on the nature of the disorder, the intensity of the hemorrhage and the age of the patient.

Medical therapy, consisting of massive blood transfusions, should always be tried first. In cases of gastroduodenal ulcer, surgical treatment may be indicated. In order to appraise the severity of the hemorrhage, it is necessary to determine the blood cell count, hemoglobin concentration, arterial pressure and pulse rate; these determinations must be repeated.

According to some authors, gastrectomy is necessary when one believes that hemorrhages will occur shortly and, above all, when the possibility exists that a new hemorrhage, causing a decrease in blood pressure, would be fatal to the patient. Surgical treatment is imperative in ulcer pateints who are more than 50 years old and particularly in patients of about this age who present symptoms of endarteritis. When surgical intervention is decided on, the blood volume must be brought to its physiologic level, so that the operation can be performed with the least possible risk.

In this respect, Delannoy of Lille stressed the uncertainty which still persists with regard to treatment in severe bleeding ulcer. Through careful observation of the patient before and after the blood transfusion, an opinion can be formed concerning the need of surgical intervention. A two-thirds gastrectomy should be the operation of choice, being the only one that can cure ulcers which erode vessels and continue to bleed in spite of blood transfusions.

Acrylic Prosthesis

Dr. Judet, by invitation, reported on this topic at one of the last sessions of the Belgian Society of Surgery.

Judet and his brother are the promoters of the acrylic prosthesis in orthopedic surgery. He believes that the prosthesis of the hip is only one of the applications of a method which has numerous indications. Acrylic resin is a material well tolerated by the tissues and can be sterilized by the usual methods. Judet has produced parts equipped for certain sites. At present the method is useful for (1) arthroplasty, (2) osteosynthesis plates and (3) replacement of missing bone.

1. Arthroplasty. This is the main application of an acrylic prosthesis. It is applied to the hip, especially for dislocation; at the shoulder, where the author has used it with success in the dry form of tuberculosis; at the elbow and at the knee, although these articulations are less suitable for the application of the method.

2. The osteosynthesis plates. The acrylic prosthesis was used by Judet in patients who complained of pain in the lower part of the back in the absence of a radiologic lesion. It accomplishes a complete blocking of the lumbrosacral articulations, bringing about the disappearance of pain and permitting earlier ambulation of the patient after operation. The author obtained therapeutic success with an acrylic prosthesis also in a case of pseudoarthrosis of the humerus.

3. Replacement of missing bone. This procedure has been used successfully in few cases. The author constructed a metacarpus in a patient who had lost this bone as a result of an injury. Judet performed a total ablation of the humerus and replaced the bone by an acrylic prosthesis in a patient with a sarcoma of the upper part of the humerus, which had already spread, with satisfactory results.

Skeletal Injuries Caused by Sports

An interesting report on the medical aspects of sports was presented by Prof. J. Verbrugge to the Belgian Medical Society of Physical Education and Sports. The report was documented and contained a discussion of the causes of and treatment for skeletal injuries due to athletics. The author differentiated between true and false lesions; the first are caused by athletic activities, the rupture of the meniscus being an example; the second type becomes apparent during the practice of sports, e. g., osteochondritis dissecans.

He reviewed successively periarthritis of the shoulder of fencers, the epicondylitis of swordsmen; the snapping of the Achilles' tendon in runners, the lesions of the knee in football players, the tearing of the spinalis dorsi and the wearing out of the meniscus in cyclists, the periauricular hematoma and the osteochondromatosis of the elbow in boxers; the march fracture of jockeys and walkers, and the lesions of the ligaments in the knee in skiers. These lesions require special surgical treatment, and ill timed therapy should be avoided.

Rotation Radiotherapy of Neoplasms

J. Henry reported to the Belgian Society of Radiology the first results observed with this new technic, which appear encouraging. Radiotherapy of tumors of the esophagus by crossfire irradiation technic, even when used in connection with radium in the cavity, has given only mediocre results. In order to administer a massive dose (approximately 6,000 r) to eradicate the deep-seated tumor, and at the same time to spare the skin and the other healthy tissues, one should rotate either the patient or the x-ray beam.

At the Institute for the Study of Tumors at the University of Brussels a rotating chair has been constructed to make possible this rotating irradiation. Small ionization chambers which may be introduced into the esophagus for measuring the doses received have also been devised.

Diverticula of the Duodenum

Boulvin reported an interesting study on the therapy of diverticula of the duodenum before the Belgian Society of Gastroenterology. Many admit that surgical treatment produces poor results and has a high mortality rate. This may be different now, because of better anesthesia and better understanding of the technical problems.

When the diverticulum is easily removable, extirpation is indicated. The symptoms in this case are due to retention,

which should be avoided; when the diverticulum is not easily removable, a partial gastrectomy may be performed. If hyperacidity continues after removal of the diverticula, a vagotomy must be performed in addition to gastrectomy. But more often it is necessary to determine whether a disturbance exists in the neighboring viscera (pancreas, gallbladder, choledochus). Often, these are the organs which are really responsible for the discomfort.

It is preferable not to operate on silent diverticula; mild disturbances can be corrected with medical treatment. When an ulcer co-exists, the ulcer should be treated first. In cases in which there is reason to believe that the disturbances will persist after gastrectomy, as when they are caused by compression, it is advisable to operate on the diverticulum even when extirpation promises to be difficult.

Present Concepts of Tropical Medicine

Van Riel has just published in *Bruxelles-Medicale* a well documented and humane report on tropical hygiene. The author shows that in tropical hygiene, for peoples who live in hot and humid zones, the main factors in prophylaxis are sterilization of virus reservoirs, chemical and bacteriologic methods of prevention for healthy subjects, extermination of the vector insects in the larva and adult stages. Raising the standard of living and of education is the *sine qua non* for an adequate hygienic program.

SPAIN

(From a Regular Correspondent)

MADRID, July 7, 1950.

Congress on Gastroenterology

The Second European Congress of National Associations on Gastroenterology was held in Madrid, May 3-7, 1950. The gastroenterology associations from several countries were represented as follows: Spain, 180; France, 59; Belgium, 29; Italy, 20; Switzerland, 13; Portugal, 11; Holland, 7; Argentine, 4; Germany, 3; Austria, 3; Brazil, 2; England, 2; The United States, 1; Philippines, 1, and Roumania, 1.

At the opening Mr. B. Perez González, Minister of the Interior of Spain; Dr. G. Arrese, general secretary of the congress; Dr. Mogena, president of the congress, and Dr. Gasbarrini, of the University of Bologna, were speakers. Dr. Gasbarrini spoke in the name of the European associations of gastroenterologists. The official topic was "Physiology, Pathology and Pathologic Anatomy of the Biliary Tract." Dr. R. A. Gregory, of Liverpool, spoke on "Physiology of the Biliary Tract." The speaker discussed (1) the methods resorted to for clinical and experimental researches on functions of the biliary tract, (2) formation of hepatic bile and factors having an influence on formation, (3) gallbladder and Oddi's sphincter and (4) components of bile from the liver and the gallbladder. He also discussed: biliary drainage in man and in animals; cholecystography; effective volume of hepatic bile secreted (hepatitis, biliary fistula in animals); choleretics (products of digestion, hormones, bile salts and similar substances); vascular and nervous factors; cholecystokinesia; nervous factors and biliary dyskinesia; motor functions of biliary tract in pregnancy, and formation of biliary calculi.

Dr. N. Henning, of Wurzburg, Germany, reported on his studies on duodenal bile in noncalculous infections of the gallbladder and of the bile ducts. He described his method for obtaining fractional samples of duodenal bile and the bacteriologic and cytologic aspects of the bile. The bacteriologic study of the bile in cholecystitis, especially in chronic cholecystitis, shows that inflammation is restricted to the wall of the gallbladder, whereas in cases of acute cholangitis and during relapses of chronic cholangitis bacteria are identified in pure cultures as well as mixed cultures of the bile. The identified bacteria found, in order of frequency, are Bacillus coli, Staphylococcus aureus, hemolytic streptococci, enterococci, pneumobacilli, Bacillus pyocyaneus, Bacillus lactis aerogenes, bacteria of the Proteus group, and, in rare instances, Frankel-Welch's bacillus. Giardia lamblia is the only animal organism found in the duodenal bile of persons living in Central Europe. Endameba histolytica, Endameba coli, eggs of ascarids Ancylostoma, Fasciola hepatica and certain varieties of Echinococcus are found in some other countries. It is difficult to carry on the cytologic study of the duodenal bile because cells from various structures are affected by rapid proteolysis in the bile. Dr. Henning studied cells in duodenal bile obtained either during operations or from cadavers. Cholagenic cells are identifiable because of their biliary hue. Leukocytes in the biliary sediment have value only if they are encountered in large number. Cells greatly resembling those from the liver were encountered in C bile and B bile. Epidemic hepatitis and cholangitic hepatitis are differentiated by determination of albumin in the bile, either cholagenic or hepatogenic. The determination is carried on by microscopic examination of the drop of dried bile.

Dr. F. E. Revers, of Utrecht, Holland, spoke on Pharmacology in diseases of the biliary tract. Treatment of inflammation of the biliary tract is by administration of disinfectant drugs, which pass through the liver, produce disinfection of the bile and, by contacting the walls of the structures of the biliary tract, stimulate secretion of bile in abundance. Antibiotics and modern chemical therapy show great pharmacologic progress. The normal liver completely eliminates the chemical drugs, whereas elimination of these drugs is diminished in diseases of the liver. Penicillin and streptomycin when given in large doses reach the bile in high concentration, higher than that in the blood. Cholagogues are used with caution because of the danger of impaction of a calculus in structures of the biliary tract, which is the major objection to Bergmann and Kalk's therapy.

Drs. C. Jiménez Díaz and H. Castro Mendoza, both of Madrid, dealt with biochemical changes of plasma in diseases of the biliary tract. Certain diatheses which are causative in biliary diseases are indicated by certain changes in the plasma. Phosphatase increases early in the course of biliary obstruction; changes of cholinesterase show pathologic changes in the liver. Determinations of cholinesterase are of value in the differential diagnosis of jaundice with severe cholemia. Cholesterase increases in biliary obstruction and diminishes when functional disorders of the liver complicate biliary obstruction. The changes of lipemia are also of importance (cholesterine and esters, total lipids, neutral fats and phospholipids). The determination of lipids is of use in the prognosis of jaundice. The speakers observed the changes of the protids in a large number of cases. The earliest changes are those shown by the Kunkel and Hanger tests, whereas longer-lasting changes are shown by the MacLagan test. The changes of cholemia in biliary obstruction are similar to those which take place in hepatitis.

Dr. J. Caroli, of Paris, spoke on "pure forms" of biliary dyskinesia. He covered the physiopathologic and roentgenmanometric fields of the subject. He discussed the question of whether the histologically normal biliary tract could be the seat of origin of acute disorders necessitating surgical intervention. The existence of pure forms of biliary dyskinesia is denied by certain pathologists. The speaker encountered three clinical types, with (1) local pain, (2) jaundice and (3) a biliary disorder with headache. In the field of roentgen manometry, dyskinesia is classified as follows: (1) dyskinesia of the gallbladder, which is caused by either cholecystic or cholecystoinfundibular bending, vertical or transversal septums or spasm of Lütkens' sphincter, and (2) dyskinesia of Oddi's sphincter, either atonic or hypertonic.

Dr. I. Pavel, of Bucharest, Rumania, spoke on clinical diagnosis of functional disorders of the gallbladder and of the bile ducts. Cholangiography and manometry, used successively or

simultaneously, are of use in the diagnosis of atony of the gallbladder. The diagnosis is checked with the Doyon-Meltzer-Lyon test. When hypertonia is present, the gallbladder looks round during cholecystography. An acute aspect is shown in the course of hepatic colic and in spasm of Lutkens' sphincter. This diagnosis was established by Schöndube. A differential diagnosis of obstruction of the cystic bile duct is made by means of roentgen manometry and the amyl nitrite test. The diagnosis of spasm of the Oddi's sphincter is easily made by duodenal intubation. The diagnosis of insufficiency of Oddi's sphincter is made on the basis of causative factors and the clinical symptoms.

Dr. P. Mallet-Guy, of Lyon, France, spoke on surgical treatment of gallbladder dyskinesia. The treatment has advanced in three periods: (1) Blind operations on "gallbladder in stagnation," (2) cholecystotomy of expectation and (3) Mirizzi's operative cholangiography. The speaker uses a technic of preoperative manometric and roentgen visualization of the gallbladder. The value of the technic for exactness of the findings has been proved by the results in 1,100 operations. He described his results from surgical treatment in hyperkinesia or hypotonicity of the gallbladder. He obtained between 75 and 82 per cent of cures from splanchnicectomy in hypotonicity and sphincterotomy in diseases of the sphincter of Oddi.

Dr. H. Kapp, of Basel, Switzerland, spoke on "Etiology of Cholecystitis." The etiologic factors most frequently found are (1) changes in the constitution of the bile, (2) a reflux of the pancreatic juice and (3) allergic hypersensitivity. Anatomicopathologic studies of the gallbladder, as carried on in a large number of cases, showed inflammation of bacterial origin.

Dr. F. Gallart Monés, of Barcelona, Spain, spoke on the clinical course of noncalculous cholecystitis.

Prof. C. Santos, of Lisbon, Portugal, spoke on roentgenologic aspects of noncalculous cholecystitis and cholangitis. He described his method for roentgen measurement of the volume of the gallbladder.

Dr. J. L. Nicod, of Lausanne, Switzerland, spoke on anatomicopathologic aspects of noncalculous cholecystitis and angiocholitis. The lesions encountered varied from inflammatory edema and phlegmon to gangrene and from acute leukocytosis to the plasmolymphocytic infiltration of chronic lesions. Some authors state that it is possible to differentiate infectious inflammation from allergic inflammation. The latter is a local reaction in the biliary structures, which is analogous to that by which Aschoff's nodules in the myocardium are produced.

Dr. T. Hernando, of Madrid, spoke on medical therapy of noncalculous chronic cholecystitis. An operation is indicated only after medical treatment has failed. Patients should have a complete and well balanced diet, with the proper quantity of fat. They should have four or five meals a day, each one moderate except supper, which should be very light. Sulfonamides, penicillin, streptomycin and intravenously administered methenamine are indicated in the febrile forms of the disease. Cholagogues and cholecystokynetic substances, mainly fats, olive oil, magnesium sulfate and peptone, are of value in preventing biliary stagnation. Antispasmodics, mainly belladonna and barbital, in small doses are of value as adjuvant medication. Glyceryl trinitrate and amyl nitrite are of use in acute forms of the disease. Vaccines, nonspecific protein therapy and balneotherapy are of value.

Dr. A. H. Douthwaite, of London, spoke on medical treatment of chronic cholecystitis. Chronic cholecystitis, with or without biliary calculi, is now rare in England; the last few years the incidence has diminished more than 50 per cent, attributed to proper diet rather than to increased physical activity of the people. In medical treatment, stimulation to induce regular emptying of the gallbladder and disinfection of the bile is necessary. During the first days of treatment duodenal intubation is performed, magnesium sulfate is introduced into the intestine and sodium dehydrocholate, 0.25 Gm. twice a day, is administered. The spasm of the common bile duct and of the sphincter is controlled by sublingual administration of 1 mg. of glyceryl trinitrate, subcutaneous injection of 100 mg. of meperidine hydrochloride and the administration of olive oil in fractional doses of 8 Gm. each, four times a day. Sulfonamides and antibiotics in combination are indicated to control infection.

Drs. A. Gasbarrini and G. Sotgiu, of Bologna, Italy, spoke on the pathogenesis of jaundice. The role of chronic inflammation of the biliary passages is demonstrated by the following facts: Histologic examination of the liver does not show damage caused by acute atrophy. Lesions are those which commonly occur in several diseases of the liver without jaundice and in so-called catarrhal jaundice. The lesions of the liver in Laennec's cirrhosis without jaundice and in some other diseases are of a more acute type. Caroli and his collaborators recently proved that the histologic changes of the liver parenchyma in catarrhal jaundice are the same as those caused by obstruction of the common bile duct. The speakers stated that catarrhal jaundice originates from gastroduodenitis, the inflammation advancing to the liver, the sphincter of Oddi and other nearby structures.

Dr. R. D. Demel, of Vienna, Austria, spoke on permanent biliary fistulas. He emphasized the importance of roentgen examination of the biliary fistula before operation.

Drs. J. Massion, P. Leonard and J. Votion, of Brussels, Belgium, spoke on congenital abnormalities of the biliary tract. They encountered important congenital abnormalities of the bile ducts in only three out of 100 necropsies.

Drs. F. van Goidsenhoven, R. Appelmans, H. Bossens and M. van Moortele, all of Louvaine, Belgium, spoke on benign, acquired stenosis of the bile ducts (excluding lithiasis). The symptoms are mechanical jaundice and angiocholitis. The speakers dealt with stricture of the bile ducts by obstruction or by compression. Stricture due to obstruction may be caused by (1) parasites, (2) benign tumors or (3) inflammation. Stricture due to compression may be caused by (1) disturbance in the pancreas, (2) adenopathies or (3) acute cholecystitis. Compression due to contracture of the extrahepatic bile ducts may occur without any relation to surgery. The prevention of postoperative stenosis consists in prevention of trauma during operation.

Drs. A. J. Bengolea and C. Velasco Suarez, both of Buenos Aires, Argentina, spoke on duodenal sounding in nonlithiasic cholecystopathy. Duodenal sounding is of both diagnostic and therapeutic value. In the course of the diagnostic test, the macroscopic and microscopic aspects of the bile and its chemical constituents should be observed. The bile from the gallbladder contains lipid substances which are detached from the wall of the gallbladder. The presence of these substances in the bile is of diagnostic value in cholesterosis of the gallbladder.

Dr. P. L. Mirizzi, of Cordoba, Argentina, spoke on cholangiography during operation. He has used the procedure in 2,300 patients with diseases of the biliary tract. He dealt with the functional and anatomic conditions of the hepatic and common bile ducts without lithiasis or carcinoma. Operative cholangiography, in vivisection and in the course of laparotomy, shows three important functions: (1) contraction and consequent dilatation of the intrahepatic tree, (2) partial or total contraction of the hepatic duct and (3) peristalsis of the common bile duct. Functional disorders of the main biliary structures are as a rule located in the sphincter of Oddi and rarely in the hepatic duct.

Dr. R. Boller, of Vienna, Austria, spoke on diseases following operations on the gallbladder and their treatment. Postoperative diseases occur in 10 to 40 per cent of cases. The speaker observed 174 patients who had been operated on between 30 and 40 years of age. Duodenal lavage, proper diet and other technics for inducing regular elimination should be employed.

If fever is present, sulfonamides and antibiotics should also be employed. Patients should be carefully selected for operation.

The next European Congress on National Associations of Gastroenterology will be held in Italy in 1952. The official topics will be "Diseases of the Pancreas" and "Clinical Problems of Constipation."

ITALY

(From a Regular Correspondent)

FLORENCE, June 30, 1950.

International Congress of Medical Aspects of Sport

The eighth International Congress of Medical Aspects of Sport was held at Montecantini-Terme May 29-31, with the patronage of the president of the republic. It was attended by several hundred persons representing 18 nations.

The first subject reported on was "Training in Physical Exercise and Its Evaluation." Professor Mitolo, who occupies the chair of physiology at the University of Bari, was the speaker. He defined training in physical exercise as a regular and systematic repetition of an activity which involves also the superior nervous functions. The factors which condition it are common to all persons; among the most important ones are the constitutional factor, the cardiocirculatory, the respiratory, that of the central nervous and sympathetic nervous systems, the endocrine, osteoarticular and muscular factor and the factors of nutrition and metabolism. Professor Mitolo then examined all the various anthropometric, morphologic and psychotechnic methods employed today for the evaluation of training, concluding that the evaluation itself must be done by judicious and full use of morphophysiologic methods, and it should be completed with the aid of the methods of psychotechnics. Among the various useful tests, the speaker mentioned the endurance test, pointing out, however, the usefulness of various tests, alone and in combination.

The second subject was "The Athletic Competition of Youth," on which a report was presented by Professor Kral of Prague. The speaker discussed first the problem of the most propitious age for the start of athletic activity, concluding that it may vary with each youth, and it should be gaged not by the physical age but by that corresponding to a certain functional efficiency of the organism, any youngster being likely to have a higher or lower efficiency than that of youngsters of the same age. In fact, a too early start of athletic activity may seriously endanger the organism and sometimes even modify the character of the young person. The speaker discussed in detail the various kinds of sport, their effects on the body and the psychophysical requisites for their practice.

Dr. Pereira of Lisbon gave the pedagogic point of view. He pointed out the need of close collaboration between physicians and teachers and emphasized the moral and biologic benefits of athletic competition, stressing the necessity of a psychosomatic approach in the preparation of youth for the practice of sports.

The third subject was "Rehabilitation of the Injured." It was reported on by Prof. P. Martin of Lausanne, Switzerland, former Olympic champion, who maintained that the concept of rehabilitation should be essentially active by encouragement of self help. Passive rehabilitation can develop only collateral action. According to Professor Martin, such rehabilitation should be applied in the first stage, immediately following the trauma, by inducing the patient to practice deep respiratory exercises and movements of the muscles not involving the injured member, while in the secondary phase the problem becomes essentially psychotherapeutic. In this period the will power of the patient plays a role of primary and decisive importance in functional recovery. Discussing in detail the various methods of active rehabilitation, Professor Martin attributed great importance to hydrotherapy, which he believes to be mainly responsible for early and effective functional recovery.

Correspondence

SOCIALIZED MEDICINE

To the Editor:—I was interested to read the letter written by Dr. Amos R. Koontz headed "The Government Cannot Force Socialized Medicine On Us" (*J. A. M. A.* July 22, page 1113).

I would warn against too strong a belief in this dictum. In California, Governor Warren sponsored a bill which was defeated again in our last legislative session. In my opinion it was the most vicious of all the socialized medicine bills so far proposed. In the last paragraph of this bill there was a provision that stated that any doctor who charged, accepted or received any payment, cash or emolument whatsoever from any patient covered under the socialized medicine bill "except that paid by the state" would automatically be guilty of unprofessional conduct as defined in the Business-Professions Code of Laws. Perusal of these laws reveals that unprofessional conduct as defined therein results in revocation of a license to practice.

It is evident that, were such a socialized medicine law passed, the only choice left to a physician would be whether he was going to stop all practice or bow to the law. He could not choose to do private practice without a license from the state. The only avenue open to liberty-loving Americans is to oppose all such socialistic schemes, if need be, to the bitter end. We should not be lulled by the false belief that a doctor could still choose how he would practice under a socialized medicine law.

Perhaps it was to forestall any possibility of physicians' resistance that this paragraph was included in Governor Warren's bill. Be that as it may, such a method could be used by unscrupulous politicians to force socialized medicine on an unwilling physician.

E. VINCENT ASKEY, M.D., Los Angeles.

OVARIAN HILUS CELLS AND ENDOMETRIAL CARCINOMA

To the Editor:—Contradictory reports have recently appeared in the literature concerning the significance and possible causative relationship of certain cells in the hilus of the ovary to endometrial carcinoma and to masculinizing syndromes. An example of this is the interesting report of Wilfred Shaw and Burjor Dastur (*Brit. M. J.* **2**:113-117, 1949), who described characteristic deeply staining polyhedral cells in the ovarian medulla of patients with endometrial carcinoma and believed they may be carcinogenic. These cells were observed in 3 cases of endometrial and in 1 case of endocervical cancer. They claimed that these cells are not found in the normal ovary.

These writers observed clusters of hilus cells in 24 of the ovaries removed in 48 cases of adenocarcinoma of the endometrium. These cells were found close to the edge of the cortex and were independent of the follicular system and were not derived from either granulosa or theca interna cells. Further, they expressed their belief that these hilus cells originated from the endothelium of small capillaries and lymphatic vessels and that they have not been described previously.

Recently, William H. Sternberg (*Am. J. Path.* **25**:493-511, 1949) described polygonal or oval cells in the hilus of the ovary and mesovarium containing acidophilic cytoplasm, with well defined granularity, morphologically identical with the testicular Leydig cells producing androgens. The nucleus was vesicular, and the chromatin clumps were coarse and rather spongy. These cells were found in clusters along the length of the ovarian hilus and in the mesovarium. Hyperplasia or neoplasm of these

cells was associated with masculinization. Shaw and his co-author apparently did not observe these so-called hilus cells described by Sternberg in 1949 and by Berger (*Compt. rend. Acad. sc.* **175**:907-909) as early as 1922.

A discrepancy is brought about by the statement of Shaw that the "first description of these cells was given by Sternberg," apparently referring to the same type of cells described by him. In the discussion of the article by Shaw and Dastur, Walter Shiller stated, "it is not likely that the clusters of cells are the only source of uterine adenocarcinoma after removal of both ovaries" (*The Year Book of Obstetrics and Gynecology* pp. 532-539, 1949). The occurrence of endometrial carcinoma is extremely unusual in women who previously have undergone bilateral oophorectomy, and only a few cases are on record. Three cases of adenocarcinoma of the uterus in the absence of the ovaries were reported by G. Van S. Smith (*New England J. Med.* **225**:608-615, 1941) and several recently by Speert and Peightal (*Am. J. Obst. & Gynec.* **57**:261-273, 1949).

Further studies are necessary to clarify this interesting situation regarding, first, the similarity, if any, of the cells described by Shaw and Sternberg and, second, the relationship of these cells both to endometrial carcinoma and masculinizing syndromes.

LEOPOLD Z. GOLDSTEIN, M.D., Philadelphia 3.

THE ELECTROCARDIOGRAM

To the Editor:—I wish to compliment Dr. J. Bailey Carter on his article "Value of the Electrocardiogram in Clinical Practice" (*J. A. M. A.* **143**:542 [June 10] 1950). It is concise and well written.

However, I wish to question the statements in the paragraph on the abnormal S-T segment and interval. He states, "The S-T segment and interval . . . is abnormal if elevated more than 1 mm. (0.1 millivolt) above or depressed more than 1 mm. below the base line of the tracing." This has always been a bothersome problem, and R-ST depression, especially after exercise, has been a difficult judgment between border lines of normal or abnormal.

In order to clarify this situation, my colleagues and I examined 220 normal pilots who showed no evidence of heart disease in routine physical examinations. We then did single "two step" exercise tests according to the Master technic. We also did double exercise tests on the same persons at a later date. In this group we found that in normal persons there was no depressed RS-T segment in any lead over 0.5 mm. on the single "two step" exercise test. In the double test, in 13 normal subjects the R-ST segment was depressed up to 1 mm. only in lead 2 and chest lead V_4 or V_5. There was no appreciable R-ST depression on any of these persons while resting.

We also found occasional normal persons in whom the R-ST segment was elevated over 1 mm. and in some as high as 1.5 mm. The R-ST segment was normal in shape with concavity upward and normal T waves. After exercise these R-ST segments returned to the base line immediately and to the resting elevation in six minutes.

On the basis of these findings I believe it is wrong to give the same clinical evaluation of the R-ST depression of 1 mm. along with 1 mm. elevation. I believe that any appreciable R-ST depression is probably abnormal if the tracing has a straight and normally inscribed base line. However, many normal persons will show a high take off over 1 mm. with concavity upward and normal shaped T wave. The standard leads that show this will be determined by heart position, will never show any reciprocal depression as in coronary disease and will return to the base line immediately after exercise. These elevations are also reflected on aV_L and aV_F, depending on whether the heart is horizontal or vertical.

If a number has to be applied to R-ST segment deviation, it would seem more accurate to have 1.5 mm. as the upper limit of normal for elevation and 0.5 mm. as the lower limit of depression of the R-ST segment.

I am anxious to hear any comment on this problem, as I believe that any depression of the R-ST is not normal and that it probably represents injury to the subendocardial region. It may be that characteristics of different machines will cause differences in base line interpretation.

J. E. SMITH, M.D.,
Chief, Medical Standards Branch,
Department of Commerce
Washington, D. C.

BLOOD PRESSURE READINGS

To the Editor:—More than thirty years ago my partner commented on the fact that almost every patient, especially male, when told that his blood pressure was to be taken, would begin to unbutton his cuff button and roll his sleeve up to a point about where the deltoid muscle is inserted, thereby making a roll of cloth which frequently left barely enough space between it and the elbow for the blood pressure cuff to be placed. In the winter time those who wore long sleeve underwear would add to the bulk of this roll and make a tight band above the pressure cuff.

He reasoned that the blood pressure cuff was simply an appliance used to cut off the circulation for the time necessary to get a reading and that this could be easily done by placing the cuff over the shirt sleeve while it was down, and then the sleeve could be easily and neatly draped over the blood pressure cuff. This made a neater job and did away with the bulky roll above the pressure cuff, which always was present when the old method was used. We began using this method and I have continued to use it through the years. Frequently one will hear the statement, "My doctor always rolls up my sleeve before applying the pressure cuff," but when the reason for the method I use is explained its advantages are apparent.

GEORGE B. FLETCHER, M.D.,
Hot Springs National Park, Ark.

E. FOURNEAU, FRENCH CHEMIST

To the Editor:—I read with interest the note that was devoted in the February 11 issue of THE JOURNAL (p. 434) to the great chemist Fourneau and to his important scientific contributions. I am sorry that you did not mention anything about his tragic experiences during the last years of his life. Before the war, Fourneau was vice president of the French-German Committee, because he believed that France had great interest in being on good terms with Germany. At the time of the liberation the old man was arrested and put in a concentration camp (on the order of somebody who should have never been permitted to issue this order); he remained there for several months. On his dismissal from the concentration camp he was expelled from the Pasteur Institute; in order to continue his research he had to organize a laboratory at his own expense. But, even in 1793, when Lavoisier was arrested and executed, some one said: "The French republic does not need learned persons."

DR. HENRI VIGNES, 23, Quai d'Orsay, Paris, France.

Medical Motion Pictures

The Bone Bank. 16 mm., color, sound, showing time 26 minutes. Prepared in 1950 by Philip D. Wilson, M.D., The Hospital for Special Surgery, New York. Produced by and procurable on rental or purchase from Sturgis-Grant Productions, Inc., 314 East 46th Street, New York 17.

The film begins with diagrams and definitions of autogenous, syndogenous and homogenous bone and describes how homogenous bone may be preserved by refrigeration or by chemical means. The usual sites from which bone is obtained for refrigeration and later use are shown in brief shots from operations. The method of storing bone in a deep-freeze unit and the technic of culturing it to test sterility are depicted.

The typical orthopedic operations which are illustrated in this film are a spinal fusion in the dorsal area for scoliosis and another in the lumbosacral area for degenerative change of these joints. Also depicted is an arthrodesis of the hip, a case of ununited fracture of the femur and two instances in which this bone is used to fill in cavities caused by destructive lesions—one a bone cyst of the humerus and the other an osteoid-osteoma of the ischium.

This film will be of particular interest and use to men who supervise large orthopedic services, particularly services where crippled children predominate. It will also be of interest to hospital administrators, who will have a hand in the decision as to whether the amount of work of this kind done in their hospital would justify the expense and the training of personnel necessary to organize and carefully supervise a bone bank program.

Orthopedic men in general should see this film, as it is based on present knowledge of the phenomenon of vascular invasion, absorption and subsequent replacement of bone grafts in general, whatever their type.

Technically, the film is well organized. The operative field is clearly shown, and the monotonous details of any lengthy surgical procedure are omitted so that only the essential points in the use of bone transplants are stressed. The photography, animation and narration are excellent.

Hospital Food Service Personnel Training. Part II, The Individual (TF8-1576). 16 mm., black and white, sound, showing time 13 minutes. Prepared in 1950 and produced by the United States Army. Procurable on loan from the Army Surgeon of the Army Area in which the request originates.

This production, aimed primarily to instruct food handlers, introduces Stupe Scattergerm, a ghost, to personnel as they prepare to go to work in a hospital kitchen and a mess hall. He represents the worst faults of food handlers with regard to personal hygiene, appearance and work habits and shows how rules of sanitary procedure are broken. Each violation is then picked up by flashback technic and contrasted with a less obvious violation of which an ordinary food handler might at some time be guilty. It shows that improper food handling can spread communicable diseases. Preventive measures such as health, cleanliness, personal appearance and sanitary work habits are illustrated.

This well organized and well directed motion picture can be highly recommended for showing to hospital administrators, public health workers, medical students, food handlers in institutions, dietitians and restaurant owners. The photography and animation are excellent. (Hospital Food Service Personnel Training. Part I, Introduction (TF8-1575), was reviewed in THE JOURNAL Dec. 3, 1949, page 1012.)

Heart-Lung Preparation (PMF 5170). 16 mm., color, sound, showing time 17 minutes. Produced in 1949 by the United States Army. Procurable on loan from the Army Surgeon of the Army area in which the request originates.

This film shows in considerable detail and with great clarity the original Starling technic whereby it is possible to isolate the heart, lungs and associated large blood vessels of an experimental animal, from the brain, abdominal viscera and extremities, while still maintaining a spontaneous heart beat under artificial respiration. The induction of anesthesia, the isolation of various nerves and vessels, the cannulations and ligations are well shown, and a final summarizing diagram reviews the arrangements in a perspicuous manner.

This motion picture will be useful in physiology and pharmacology courses for medical students and graduate students, particularly where facilities for animal experimentation are limited. It would be of doubtful interest in classes of physiology for nurses and college students and would not especially interest audiences of practicing physicians or of nonprofessional persons. The narration and photography are excellent.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Right of Undertaker to Give Opinion as to Cause of Death.—The defendant was charged with the murder of a Negro woman by having beaten her over the head with a piece of wood. From a judgment of conviction he appealed to the court of criminal appeals of Texas.

The defendant's main contention on appeal related to the admission of certain testimony of the undertaker who handled the body of the victim. The undertaker testified that as a student of an embalming school he had studied anatomy of the human body, chemistry and various semimedical courses, that he graduated from such school and had since that time engaged in his profession as an embalmer, and that he had handled many bodies on which extreme violence had been used. He testified that the body of the victim was found with the head crushed and mangled, with a number of holes in the skull and portions of the brain protruding therefrom; that there were five or six holes in the hollow through the head at different angles with the skull being crushed. On being asked what, in his opinion, caused the death of the victim the trial court permitted him to answer as follows: "Well, in my opinion, it was from hemorrhage of the brain, from the power of the blow that she got in there, which crushed the skull, and the skull was found mangled around in the head, and either one of the blows would cause death because of the loss of blood and the destroying that circulation up there among the brain."

We think, said the court of appeals, that the witness was qualified from his education and experience, as well as his observation of the body, to give his opinion as to what caused the death. Accordingly the judgment of conviction was affirmed. —*Murria v. State, 227 S. W. (2d) 537 (Texas, 1950).*

Hospitals in General: Liability for Death of Patient Following Blood Transfusion.—This was an action for damages for the death of a patient resulting from a transfusion of incompatible blood which had been erroneously tested and reported as compatible by a technician in the hospital laboratory. From a judgment in favor of the plaintiff, the hospital appealed to the United States court of appeals, District of Columbia.

The main question, said the court of appeals, is whether or not such a relationship prevailed between the hospital and the technician as to render the hospital liable on the principle of respondeat superior. The trial court held that a master and servant relationship did exist. We think the trial court was right, said the court of appeals. The undisputed evidence showed that the laboratory was an established part of the hospital. By arrangement with an outside physician it was operated under his over-all direction. The technician was hired and paid by the hospital. In the instant case the hospital, in usual course, ordered a laboratory test. The technician, without the presence or supervision of the physician, made the test and submitted her report directly to the hospital. Relying thereon the hospital made the transfusion. In our opinion, concluded the court of appeals, the facts clearly established the responsibility of the hospital for the acts of its technician. Furthermore, the court of appeals added, that responsibility is unaffected even though statute requires that the technical work in the laboratory be put under the "direction" of a physician. Accordingly the judgment of the trial court in favor of the plaintiff was affirmed. —*National Homeopathic Hospital v. Phillips, 181 F. (2d) 293 (1950).*

CURRENT MEDICAL LITERATURE

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Annals of Surgery, Philadelphia

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Address of the President: Problems in Training of Surgeon. A. Blalock. —p. 609.
Acute Arteriovenous Aneurysm of Right Common Carotid Artery and Internal Jugular Vein: Transpleural Approach to Control the Arterial Supply. M. Gage.—p. 617.
Control of Blood Transfusion Hazards. R. D. McClure, F. W. Hartman and G. H. Mangun.—p. 628.
Sickle Cell Anemia: Surgical Problem. H. Wilson, R. H. Patterson and L. W. Diggs.—p. 641.
*Newer Concepts of Blood Coagulation, with Particular Reference to Postoperative Thrombosis. A. Ochsner, J. H. Kay, J. T. DeCamp and others.—p. 652.
Tissue Reactions to Tantalum Mesh and Wire. A. R. Koontz and R. C. Kimberly.—p. 666.
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*External Endometriosis—Scourge of Private Patient. R. B. Scott and R. W. Te Linde.—p. 697.
Wry-Neck Facial Distortion Prevented by Resection of Fibrosed Sternomastoid Muscle in Infancy and Childhood. J. B. Brown and F. McDowell.—p. 721.
Closed Treatment of Acute Hematogenous Osteomyelitis: Results in 67 Cases. G. A. Caldwell and J. Wickstrom.—p. 734.
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Ureteral Tumors. H. L. Douglass.—p. 755.
Calcified Cyst of Spleen with Preliminary Report of Experimental Occlusion of Blood Supply of Spleen. J. D. Martin Jr., E. L. Zega and N. E. Adamson Jr.—p. 765.
Splenic Artery Ligation in Palliation of Ascites. R. M. Moore, A. O. Singleton Jr. and W. H. Pickett.—p. 774.
*Balloon Tamponage for Control of Hemorrhage from Esophageal Varices. R. W. Sengstaken and A. H. Blakemore.—p. 781.
Biliary Tract Hemorrhage: Source of Massive Gastro-Intestinal Bleeding. H. H. Kerr, M. Mensh and E. A. Gould.—p. 790.

Blood Coagulation and Postoperative Thrombosis.—Ochsner and his associates found that the incidence of thrombo-embolism at the Charity Hospital in New Orleans increased in recent years. The cases of thrombo-embolism, per hundred thousand admissions in the five-year period from 1941 to 1946 amounted to 147, whereas in the two-year period, 1946 to 1948, the number increased to 230. Whether the increase in thrombo-embolism was due to the use of antibiotics or to the administration of large amounts of blood is not clear. There is evidence that antibiotics do increase coagulability. Thrombin is necessary for the conversion of fibrinogen to fibrin, but since thrombosis does not occur in every patient who has been subjected to trauma, it appears likely that normally thrombin is inactivated by circulating antithrombin. The circulating antithrombin may be alpha tocopherol which is normally present in the alpha globulin and gamma globulin fractions of the blood. Antithrombin levels were determined before and after operation together with prothrombin times and fibrinogen B levels in 301 surgical patients. It was found that if antithrombin levels were 1 to 32 or higher and continued at these levels, intravascular clotting did occur. The 301 surgical cases may be broken down into three groups: a control group in which no therapy was used, a group in which alpha tocopherol alone were used, and a third group in which alpha tocopherol and calcium was used. Alpha tocopherol alone gave approximately the same results as those obtained in the control series. If a trace of calcium was added to the plasma, active antithrombin was demonstrated. The authors recently used a combination of alpha tocopherol and calcium. The alpha tocopherol acetate was given by mouth or, if this was not possible, intramuscularly. Calcium gluconate was given intravenously every 48 hours. There were 34 cases in which a combination of alpha tocopherol and calcium were used prophylactically. The authors feel that where a fatal pulmonary embolism occurred despite this treatment, the patient undoubtedly had an undetected phlebothrombosis before alpha tocopherol and calcium therapy was instituted. Persons with phlebothrombosis under anticoagulant therapy can have repeated pulmonary infarction even though further coagulation is prevented by the anticoagulant. One advantage of maintaining a high antithrombin level in the blood by means of alpha tocopherol and calcium rather than by anticoagulants is that it does not produce a hemorrhagic tendency, which is likely when anticoagulants are given. The authors administered alpha tocopherol and calcium to patients who have undergone transurethral prostatic resection or even to those with hemorrhagic tendency, including hemophilia, but never observed hemorrhage.

External Endometriosis.—Scott and Te Linde state that 516 cases operated on at the Johns Hopkins Hospital showed pathologically proved external endometriosis. External endometriosis was encountered in 2.7 per cent of the gynecologic abdominal operations in the colored female, 3.2 per cent in the white charity patient, and 15.9 per cent in the private patient. The condition seems to be more frequent in the higher economic levels of society. The recent increase in the incidence of external endometriosis was almost entirely in private patients. The most frequent age incidence was between 31 to 40 years. Menorrhagia and/or metrorrhagia is not a common symptom of endometriosis alone. Although a symptom in 44.1 per cent of the total cases and 26.6 per cent of the primarily endometriosis cases, it is usually due to an associated pelvic lesion. Pain and dysmenorrhea are frequent symptoms, but again may just as commonly be dependent upon associated lesions. Other symptoms ranged from headaches to swollen ankles, but an enlarging abdomen, backache, sterility, pain in the rectum and urinary symptoms were among the more noteworthy ones. Seventy-nine and eight tenths per cent of cases had endometriosis or an endometrial cyst in one or both ovaries. Myomas were present in 57.4 per cent of the total cases and endometrial hyperplasia in 2.5 per cent. Adenomyomas or adenomyosis was found in 63, or 12.2 per cent of the cases. Three intra-uterine and one ruptured tubal pregnancy were encountered in this series. Two cases of ovarian adenocarcinoma are cited as examples of possible malignant transformation of endometriosis. Evidence is presented against the "retrograde menstruation" theory. Surgical treatment is advisable, but the child-bearing function should, if possible, be preserved. Thirty-eight subsequent pregnancies in 26 patients of the 64 followed was the reward for preserving childbearing function. Presacral neurectomy is considered a useful procedure when the uterus is not removed and dysmenorrhea is a major preoperative complaint. There was no evidence that estrogenic hormones activated the endometriosis when given in therapeutic amounts for the alleviation of menopausal symptoms.

Balloon Tamponage for Bleeding Esophageal Varices.—A specially designed esophageal balloon was successfully employed by Sengstaken and Blakemore for the control of bleeding from esophageal varices in 30 patients. There were no deaths from shock due to hemorrhage. An asset of primary importance, in addition to its efficiency in stopping hemorrhage, is the fact that the tube and the balloon are well tolerated by the average patient and may be employed for long periods

of time. In cirrhosis with severe liver damage bleeding from esophageal varices may be unduly prolonged because of an alteration in the clotting mechanism due to hypoprothrombinemia. This was illustrated in a case in which the nasogastric tube was left in place for seven weeks, during which period the patient was tube fed. This patient was later able to resume his work as editor. The balloon is helpful in preparing patients with portal hypertension complicated by hemorrhrage for the portacaval shunt operation. There are patients with cirrhosis of the liver who have repeated attacks of hematemesis because of a severe portal hypertension. Such patients are doomed to die unless they obtain operative relief. The authors found that in 71 cases of cirrhosis in which a portacaval shunt was established, there were 15 cases belonging to this desperate group. The nasogastric tube bearing the reinforced esophageal balloon did good service in this group in affording control of hemorrhage during that treacherous period when transfusions are given before the operation. Thirteen of the 15 survived. Employment of the balloon tamponage involves a great saving for blood banks, because to keep a patient with recurrent hemorrhages from esophageal varices alive, as many as 22 pints of blood have been used.

Arch. Indust. Hygiene and Occupat. Medicine, Chicago

1:601-700 (June) 1950

Ninth Annual Congress on Industrial Health. Report of the Panel on Environmental Hygiene.—p. 601.
Pharmacologic Studies of Furfuryl Alcohol. E. A. Fine and J. H. Wills.—p. 625.
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Acute Toxicity of Zirconium, Columbium, Strontium, Lanthanum, Cesium, Tantalum and Yttrium. K. W. Cochran, J. Doull, M. Mazur and K. P. DuBois.—p. 637.
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Incidence of Cancer in Carbon Black Industry. T. H. Ingalls.—p. 662.
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Arizona Medicine, Phoenix

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Connecticut State Medical Journal, Hartford

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Journal of Experimental Medicine, New York

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Studies on Herpetic Infection of Mice: V. Influence of Route of Inoculation on Susceptibility to Herpetic Infection; Effect of Age and of Methylcholanthrene. C. A. Evans, H. B. Slavin and G. P. Berry.—p. 527.
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Journal of Lab. and Clinical Medicine, St. Louis

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Comparison of Huggins' Tests with Sedimentation Rate, Weltmann Reaction, and Bolen Test in Cancer. J. V. Finnegan, I. Brockland, R. O. Muether and others.—p. 708.
Vitamin B_{12} Concentrate in Maintenance of Pernicious Anemia. G. C. Meacham, P. J. Vignos, R. W. Heinle and others.—p. 713.
*Aplastic Crisis in Sickle Cell Anemia: Study of Its Mechanism and Its Relationship to Other Types of Hemolytic Crises. K. Singer, A. G. Motulsky and S. A. Wile.—p. 721.
Influence of Sodium Salicylate and Sodium Gentisate on Proteinuria of Lipemic Nephrosis. W. Heymann, C. Gilkey, M. Salehar and E. Gold.—p. 737.
*Role of Spleen in Radiation Injury and Recovery. L. O. Jacobson, E. L. Simmons, E. K. Marks and others.—p. 746.
Immunologic Response of Children to Injection of Chick Embryo Propagated Mumps Virus Vaccine, as Measured by Complement Fixation Test. V. Cabasso, J. M. Ruegsegger, G. K. Looser and H. R. Cox.—p. 771.

Aplastic Crisis in Sickle Cell Anemia.—Singer and his associates describe an "aplastic" crisis which occurred in the course of a clinically demonstrable virus pneumonia in a patient with sickle cell anemia. On admission the patient showed reticulocytopenia, leukopenia, and erythrocytic aplasia of the marrow. Within three days the red cell level dropped to about 50 per cent of its previous level. Six days later, numerous reticulocytes and nucleated red cells reappeared in the blood and the marrow had reverted to an extreme hyperplasia of the erythropoietic tissue. The "aplastic" crisis is supposedly due to the combination of absent red cell production together with an unaltered rapid elimination of the defective erythrocytes from the circulation. It was attempted to demonstrate this mechanism in this case by determination of the survival time of the patient's erythrocytes seven months after his recovery. About 50 per cent of the transfused cells disappeared within three days—a finding in agreement with the observed elimination of about half of the red cell mass during the crisis. Analysis of the survival time graphs of the erythrocytes of this and other patients with sickle cell anemia demonstrates that different portions of the red cell population show a variable degree of destructibility. The erythropoietic aplasia in this patient appears to be related to the infective agent causing the pneumonia. This interpretation is supported by instances of familial crises in hereditary spherocytosis associated with infections and the finding of an erythroblastopenic marrow in a hematologically normal patient with virus pneumonia. The factors responsible for the variable destructibility of the erythrocytes in sickle cell anemia are discussed. The recent discovery of abnormal hemoglobin in this disease does not fully explain this phenomenon. It seems necessary to postulate an additional extrinsic or intra-erythrocytic factor which also contributes to the premature disintegration of these defective erythrocytes. A precipitous decrease of the red cell level in hemolytic syndrome may be (*a*) of the "aplastic" type, caused by a sudden cessation in the delivery of cells without exaggeration of the already accelerated hemolysis; (*b*) of the hyperhemolytic type, induced by an abrupt augmentation of erythrocyte destruction above the precrisis level without primary interference with production and release; and (*c*) of the aplastic-hyperhemolytic type, a combination of absent delivery of cells associated with increased hemolysis. The reported case belonged in the first category. The "aplastic" crisis should be considered as occurring in various hemolytic disorders and not as limited to hereditary spherocytosis. An imminent "aplastic" crisis in a patient with hemolytic syndrome should be suspected if the absence of polychromatic erythrocytes (reticulocytes) is noted on the film. If sufficient attention is paid to this sign, more instances of this type of crisis may be diagnosed.

Role of Spleen in Radiation Injury.—Jacobson and his associates reported that a single dose of 600 r whole body irradiation regularly produced a severe anemia, leukopenia, and thrombocytopenia in CF-1 female mice. No anemia but a leukopenia and thrombocytopenia of lesser severity and shorter duration occurred in mice given this dose if the spleens were mobilized through an abdominal incision and lead-protected during irradiation. Summarizing observations on four groups of animals the authors state that a severe anemia, leukopenia, thrombocytopenia, and reticulocytopenia occurred in mice without lead protection of the spleens that were exposed to 1,025 r whole body irradiation. No animals thus exposed survived beyond the thirteenth day after irradiation. No significant anemia and only a transient leukopenia and thrombocytopenia occurred in mice given this dose (1,025 r whole body irradiation) if the spleen was surgically mobilized and lead-protected during irradiation. Forty-two per cent of these mice survived beyond the twenty-eight days of observation. The lymphatic tissues (thymi, lymph nodes, and spleens) of mice without lead protection of the spleen during irradiation were reduced to a reticulum stroma and no recovery was apparent during the thirteen days of observation. The lymphatic tissues of mice with lead protection of the spleens during irradiation never became depleted of free cells and resumed an essentially normal cellularity by the seventh or eighth day after irradiation. Ectopic erythrocytopoiesis and granulocytopoiesis were increased remarkably in these lymphatic tissues by the eighth day after irradiation. Hematopoiesis in the bone marrow of mice without lead protection of the spleen during irradiation was destroyed; the bone marrow remained thus depopulated through the tenth day after irradiation, and only beginning regeneration was apparent on the eleventh day after irradiation. Atypical fibrous tissue involving chiefly the metaphysis and epiphysis but occasionally involving the diaphysis as well was prominent at all intervals of study from the fourth day on. The bone marrow of mice with lead protection of the spleen during irradiation was never depleted of free hematopoietic cells and was normal in cellularity at seven or eight days and hyperplastic thereafter. Atypical fibrous tissue was inconspicuous in the bone marrow of this group. A marked increase occurred in ectopic blood formation in the lead-protected spleen of the animals given 1,025 r whole body irradiation.

J. Neuropathology & Exper. Neurology, Baltimore

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Journal Pharmacology & Exper. Therap., Baltimore

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New England Journal of Medicine, Boston

242:641-688 (April 27) 1950

*Clinical Response of Rheumatic Fever and Acute Carditis to ACTH. B. F. Massell, J. E. Warren, G. P. Sturgis and others.—p. 641.
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242:689-736 (May 4) 1950

Treatment of Cancer of Cervix by Radium and Deep X-Rays: Experience at Rhode Island Hospital, 1933-1943. G. W. Waterman and S. I. Raphael.—p. 689.
*Clinical Response of Rheumatic Fever and Acute Carditis to ACTH. B. F. Massell, J. E. Warren, G. P. Sturgis and others.—p. 692.
Typhoid Enterocolitis Stimulating Chronic Bacillary Dysentery: Report of Case with Cure by Chloromycetin. E. M. Rappaport and E. O. Rappaport.—p. 698.
Recurrent Post-Infarctional Shoulder-Hand Syndrome: Report of Case with Unusual Clinical Evolution. E. Kammerling, G. N. Lewis and L. Ehrlich.—p. 701.
Neurosurgery, 1941-1950. D. Munro.—p. 702.

Response of Rheumatic Fever to Pituitary Adrenocorticotropic Hormone.—Massell and his associates studied the effect of pituitary adrenocorticotropic hormone (ACTH) on 10 patients with acute rheumatic fever. The treatment was terminated in 6 and is being continued in 2. The clinical response was satisfactory in all but 1 of the 10 patients. In spite of transient withdrawal reactions encountered in some cases at the end of therapy, the rheumatic process subsided within four to ten weeks in 5 of 8 patients who were followed one to four months. In 1 of the remaining 3 patients the response was slower, but a state of quiescence was finally attained. Another patient improved considerably but still has low grade, active rheumatic fever. There was no improvement in the third patient. Significant systolic or diastolic murmurs, or both, regressed in 3 patients. A tendency of the hormone to cause retention of fluids may result in an aggravation of congestion, but suppression of the rheumatic process and consequent improvement in the myocardium tends in the long run to relieve congestion. In cases in which pituitary adrenocorticotropic hormone caused an accumulation of fluids, congestive failure could be controlled by a low sodium diet and mercurial diuretics. Another important untoward reaction was the development of severe mental depression in 1 patient. Abdominal cramps, headache and the development of roundness of the face, acne and skin striae were minor side effects. The minimal effective individual dose seems to be between 5 and 10 mg. and the minimum daily dose between 20 and 50 mg. Pituitary adrenocorticotropic hormone probably acts by causing an increased endogenous production of 11,17-oxysteroids by the adrenal cortex, but the mechanism by which the adrenocortical steroids in turn suppress the active rheumatic process is not known.

North Carolina Medical Journal, Winston-Salem

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Malignant Disease of Stomach: Possible Methods of Increasing Number of Five-Year Cures: Analysis of 57 Cases. W. W. Vaughan and T. W. Crowell.—p. 229.
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*Congenital Tuberculosis: Report of Case and Review of Literature. J. R. Burgess Jr.—p. 239.
Megacolon: Review of Literature and Report of Case in the Aged. B. Creech.—p. 241.
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Effect of Tobacco Smoking upon Gastric Acidity. H. H. Hodges and M. T. Gilmour.—p. 249.
Legality of Human Sterilization in North Carolina. J. S. Bradway. —p. 250.

Congenital Tuberculosis.—Burgess reports a woman, aged 26, whose seventh pregnancy was uncomplicated until three weeks before delivery, when she developed pain in the lower abdomen. Her mother had died from tuberculosis four years previously and one sister was still ill with the disease. The woman was delivered of a premature infant, who at the time of delivery had respiratory difficulty and a distended abdomen. The placenta showed numerous nodular white or greyish yellow

lesions. Acid-fast organisms were found within the cytoplasm of the large mononuclear cells of these nodules. Microscopic study revealed small focal lesions. These areas were abscess-like and revealed large numbers of acid-fast bacilli. The mother's course was stormy. Physical examination of the chest was negative until the seventh postpartum day, when occasional dry rales were heard. On the ninth day roentgen examination of the chest showed a soft, mottled infiltration extending from the apex to the base bilaterally. The process seemed to be fresh and was thought to represent a miliary infection. A smear of material taken from the uterus on the eleventh day was negative for tubercle bacilli, but guinea pig inoculation was positive. After a progressively downhill course, with increasing delirium, the mother expired on the twelfth hospital day. Autopsy revealed pulmonary tuberculosis with generalized disseminated tubercles found in the endocardium, kidneys, brain, meninges, endometrium and myometrium. The infant lived only five hours. The postmortem revealed acute congenital disseminated tuberculosis involving the liver, lungs, spleen, mesenteric mediastinal and hilar nodes and the kidneys.

Physiological Reviews, Baltimore

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Causes of Unsatisfactory Results After Operation on Gallbladder and Bile Ducts. R. B. Cattell.—p. 351.

Southern Surgeon, Atlanta, Ga.

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*Deaths Following Vagotomy. R. W. Postlethwait and H. H. Bradshaw.—p. 437.
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Surgical Treatment of Protruded Intervertebral Cervical Disc. W. G. Haynes.—p. 496.
Arterial Aneurysms. B. McSwain and W. Diveley.—p. 501.
Epidermoid Carcinoma of Ureter: Report of Case. J. U. Reaves and A. D. Henderson.—p. 509.

Deaths Following Vagotomy.—Postlethwait and Bradshaw sent 266 cards to physicians interested in vagotomy and 201 cards were returned. From this group and from the literature, 3,678 vagotomies were collected and from these two sources the case records on 77 patients who died after vagotomy were obtained. Analysis of the deaths discloses no reason for or against the procedure. Only few of the deaths were attributed directly to the vagotomy, whereas the majority might have followed any major operation. Some of the deaths would probably have occurred within a few months had the patient had no surgical treatment. Measures should be undertaken to avoid vagal reflex deaths. Ethylene or ether anesthesia might be preferable to cyclopropane, because the latter will cause alteration in cardiac conduction. Preliminary novocaine injection and gentleness in manipulating the vagus nerves also seems important. Electrodes should be available to assist in converting ventricular fibrillation. The vagus nerves may be so deeply imbedded in the esophageal musculature as to require dissection under direct vision to avoid laceration of the esophagus. If the stomach cannot be decompressed by a transnasal intragastric tube, then gastrostomy or gastroenterostomy may be required to avoid aspiration pneumonia. The frequency of pulmonary embolus suggests the necessity for frequent examination of the extremities and therapy should phlebothrombosis develop. The probability of gastric retension should be recognized and measures carried out to prevent its occurrence. The abdominal approach is preferable in order that the ulcer may be examined. In gastric ulcer, resection is probably preferable to vagotomy, in order that no carcinoma be overlooked.

Surgery, St. Louis

27:645-804 (May) 1950

Surgery in Relation to General Medicine. H. Ogilvie.—p. 645.
Effect of Priscoline, Papaverine, and Nicotinic Acid on Blood Flow in Lower Extremity of Man: Comparative Study. R. A. Murphy Jr., J. N. McClure Jr., F. W. Cooper Jr. and L. G. Crowley.—p. 655.
Primary Resection and Aseptic End-To-End Anastomosis for Acute or Subacute Large Bowel Obstructions. I. D. Baronofsky.—p. 664.
Blind Intestinal Pouches Resulting from Lateral Anastomoses. C. J. Heifetz and H. R. Senturia.—p. 673.
Rectus Muscle Sling for Neurogenic Incontinence. E. E. Ewert and L. D. Flint.—p. 688.
Simple and Effective Method for Holding Rectal Tube in Place Following Surgery. E. A. Gaston.—p. 699.
Anaerobic Infection of Biliary Tract: Review and Analysis of 13 Cases from Literature with Addition of 8 New Cases. L. E. Schottenfeld.—p. 701.
Primary Adenocarcinoma of Appendix: Report of Case. E. S. Marks and H. W. Whitaker Jr.—p. 720.
Primary Suture of Divided Cervical Trachea: Preliminary Experimental Study. B. Maisel and J. A. Dingwall.—p. 726.
Lobectomy for Bronchiogenic Carcinoma. D. B. Effler.—p. 730.
*Simplified Method of Dressing and Skin-Grafting Extensive Burns. F. R. Denman.—p. 740.
Excretion of Nitrogen and Electrolytes Following Thermal Burns in Rat. J. W. Braasch, J. H. Bell and S. M. Levenson.—p. 743.
Experience with Vitallium Plates in Repair of Hernias. R. W. McNealy and J. A. Glassman.—p. 752.
Ruptured Intervertebral Disc Problem in Veteran. G. S. Parrella and A. Zovickian.—p. 762.
Tibiofibular Synostosis for Non-Union of Tibia. H. Milch.—p. 770.

Dressing and Skin Grafting Extensive Burns.—Denman shows that the preparation of large granulating wounds for skin grafting requires frequent changes of dressings. These procedures are arduous and lengthy, particularly in the adult. They require several assistants and much awkward and shock-provoking positional change of the anesthetized patient. Many advantages are gained by utilizing a suitable orthopedic table. The extremities and greater portion of the trunk can be suspended, both in the supine and prone positions. Dressings can be rapidly removed, skin grafts taken and applied, and new dressings completed without the necessity of clumsy and strenuous elevation of the extremities or trunk. To stabilize the patient, very little traction is necessary in the supine position and only slightly more in the prone. Two teams may operate simultaneously. Old dressings are removed and necessary cleansing and débridement done while grafts are taken. Other grafts are cut as previous ones are sutured in place. When sufficient skin has been taken, donor areas are dressed and the donor surgeon joins the recipient team. With this method, less effort is expended, operating and anesthesia time are shortened, and shocking positional manipulations are obviated, enabling the patient and the surgeons to better withstand the procedure.

Virginia Medical Monthly, Richmond

77:211-268 (May) 1950

Streptomycin in Tuberculosis, Its Use and Abuse. W. E. Apperson.—p. 213.
Poliomyelitis: Respiratory Embarrassment. L. E. Sutton Jr. and F. L. Angell.—p. 216.
Complaint of "Forgetting" Following Electroshock. C. G. Holland.—p. 221.
Treatment of Generalized Miliary and Meningeal Tuberculosis with Streptomycin and Promizole—Report of Case. F. R. Whitehouse.—p. 227.
Tuberculin Test in Young Children as Aid in Adult Tuberculosis Case Finding. E. L. Kendig Jr. and E. J. Evans.—p. 235.
Dissecting Aneurysm of Aorta with Complete Occlusion at Bifurcation Simulating Saddle Embolism. T. E. Stanley, C. Harrison and R. R. Landes.—p. 237.
Primary Cancer of Lung. A. L. Kruger.—p. 240.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted.
Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine, Liverpool

44:1-106 (April) 1950. **Partial Index**

Field Study on "Gammexane" and Malaria Control in the Belgian Congo: II. Effect of Spraying of Houses with "Gammexane" on Mosquito Population and on Malaria Incidence in Children. G. Davidson.—p. 1.
Treatment of Urinary Bilharziasis with Miracil D and Nilodin. W. Alves.—p. 34.
Cattle Trypanosomiases: Some Considerations of Pathology and Immunity. R. N. T.-W.-Fiennes.—p. 42.
Parasite-Host Relationship in Malaria. N. H. Swellengrebel.—p. 84.

British Journal of Dermatology and Syphilis, London

62:195-238 (May) 1950. **Partial Index**

Kaposi's Varicelliform Eruption, with Virus Studies. C. H. Whittle, A. Dyell, J. A. R. Miles and M. G. P. Stoker.—p. 195.
Hereditary Koilonychia. F. F. Hallier.—p. 213.
Sebocystomatosis. D. S. Anderson.—p. 215.

British Journal of Ophthalmology, London

34:265-328 (May) 1950

*Failing Vision Caused by Bony Spike Compressing Optic Nerve Within Optic Canal: Report of 2 Cases Associated with Morgagni's Syndrome Benefited by Operation. M. A. Falconer and B. E. Pierard.—p. 265.
Haidinger's Brushes and Retinal Receptors with Note on Stiles-Crawford Effect. A. Stanworth and E. J. Naylor.—p. 282.
Exploration of Orbit. W. H. Summerskill.—p. 292.
Clinical Study of Diabetic Retinal Angiopathy. N. Pines.—p. 303.
Congenital Entropion Due to Epiblepharon. I. Czukrász.—p. 318.
Unusual Case of Retinal Detachment. J. G. Milner and D. A. Langley.—p. 320.
Primary Tuberculosis of Conjunctiva. S. Kamel.—p. 322.

Failing Vision Caused by Bony Spike Compressing Optic Nerve.—Falconer and Pierard report 2 cases of unilateral visual failure, both due to compression of the optic nerve by a bony spike situated within the optic canal. Both were benefited by decompressing the optic nerve, and in 1 case the bony spike was removed as well. Both patients presented signs of Morgagni's syndrome (hyperostosis frontalis interna, obesity and hirsutism), although neither had obvious psychiatric disorders. They appear to be the only cases of the syndrome, at present recorded, in which the visual failure was shown to be due to compression of an optic nerve by a bony spike or osteophyte situated within the optic canal. It seems likely that many cases of this condition must have been missed in the past and consequently have gone unrelieved. In skilled hands the surgical decompression of the optic nerve should carry a negligible mortality and should improve the prospects of patients with this condition. The 2 cases illustrate the value of quantitative visual field studies and of careful radiography of the optic canals (foramens) in all cases of failing vision, with or without optic atrophy, in which the cause of visual failure is obscure. The demonstration of a bony spike in the optic canal, the position of which can be correlated with the position of a progressive visual field defect, is sufficient justification for surgical intervention.

Glasgow Medical Journal

31:139-174 (April) 1950

Chemical Determination of Oestrogens in Human Urine. S. L. Tompsett.—p. 139.
Spontaneous Perforation of Oesophagus: Review of Literature and Report of Case. J. D. Thomson.—p. 151.
*Telephone Transmission of Tuberculosis: Does it Occur? J. S. Gemmill.—p. 158.

Possibility of Telephone Transmission of Tuberculosis.—Gemmill describes investigations into the occurrence of 3 cases of pulmonary tuberculosis among members of an office staff. It is reasonably certain that 1 patient infected the other 2. Although a telephone used by all 3 patients cannot definitely be incriminated as the chief factor in transmitting infection, there is circumstantial evidence which cannot be explained on any other basis. The author reviews earlier investigations on this problem. He does not imply that use of telephones plays a significant part in the spread of infectious disease. The findings do suggest, however, that under certain conditions spread by this means is possible.

Journal of Pathology and Bacteriology, Edinburgh

62:1-136 (Jan.) 1950. **Partial Index**

Pathogenesis of Non-Inflammatory Cerebral Aneurysms. R. Carmichael.—p. 1.
Myocardial Regeneration in Experimental Ischaemic Lesions of Heart. P. A. Ring.—p. 21.
Parathyroid Tumour with Visceral Metastases. E. S. J. King and B. Wood.—p. 29.
Squamous Metaplasia of Peritoneum. L. Crome.—p. 61.
Primary Pulmonary Hypertension and Related Vascular Changes in Lungs. H. Spencer.—p. 75.
Penicillin Inactivators of Bacterial Origin. J. W. Czekalowski.—p. 85.

Lancet, London

1:889-936 (May 13) 1950

Cardiac Failure. B. T. Parsons-Smith.—p. 889.
Perforated Peptic Ulcer: Assessment of Value of Nonoperative Treatment. B. McN. Truscott and J. F. R. Withycombe.—p. 894.
Trial of β-Naphthyldi-2-Chloroethylamine (R48) in Leukaemia, Hodgkin's Disease, and Allied Diseases. W. B. Matthews.—p. 896.
Flaxedil in Laryngeal Intubation. A. G. Doughty.—p. 899.
*Use of Albumin-Active Antisera in Rhesus Typing. E. M. Stirk.—p. 902.
Myomata of Vermiform Appendix. N. N. Iovetz-Tereshchenko.—p. 903.
Fatal Poisoning with Udolac (Diaminodiphenylsulphone). R. Davies.—p. 905.
Active Splinting for Radial-Nerve Palsy. K. W. N. Palmer.—p. 906.
Liver Choline-Esterase in Malnourished Infants. J. Waterlow.—p. 908.
Cleanliness of Surgeons' Aprons. D. C. Corry.—p. 909.

Use of Albumin-Active Antiserums in Rhesus Typing.—According to Stirk there is a steady rise in the number of persons who have received a blood transfusion. Since the range of conditions for which transfusions are given is still widening, many of them stand a fair chance of receiving blood again later in life. On account of shortage of typing antiserums many Rh-negative persons have received Rh-positive blood and are in danger of having severe reactions from sensitization during further transfusions. The Rh typing of patients before transfusion thus becomes necessary, but this is impracticable because the supplies of Rh-typing antiserums active on saline red-cell suspensions are being largely used in antepartum tests. Little use has been made of the abundant supply of Rh-antiserums active on red cells suspended in albumin solution. The author used albumin-active antiserums, which he obtained from mothers recently delivered of infants with hemolytic disease, in the Rh typing of 206 patients who were receiving blood transfusions. The blood is obtained within two or three weeks of parturition. It is allowed to clot at room temperature and is then placed in the cold room at 4 C. three or four days until the clot has fully retracted. The separated serum is next pipetted off and stored in small test tubes in the freezing cabinet at minus 10 C. These conditions of storage are imperative, for in serum stored at 4 C. in the blood bank, deterioration begins quickly. Serum for day to day use is withdrawn in amounts of 2 to 3 cc. from the stock tubes as required. The author believes that this type of serum should be used for the pretransfusion typing of hospital patients. He describes a tube incubation technic which gives results in fifteen minutes. It can readily be mastered by the hospital pathologist and is more reliable than the Chown capillary tube technic. The interpretation of results offers no difficulty.

Medical Journal of Australia, Sydney

1:457-484 (April 8) 1950

*Anticoagulants in Management of Cardiac Infarction: Pathological and Clinical Study. W. M. Rose.—p. 457.
Rectal Prolapse. T. E. Wilson.—p. 461.
Treatment of Tremor-Rigidity Syndrome (Parkinson's Syndrome) with "Diparcol." W. L. Reid.—p. 465.
Experiences with Refrigeration Anaesthesia in General Practice. B. A. Cook.—p. 467.
Role of Subscapularis Muscle in Stability of Shoulder Joint, and Magnuson Operation. J. Hens.—p. 468.

Anticoagulants in Cardiac Infarction.—Rose reports on 100 patients in whom a cardiac infarct was observed at necropsy. A clot was present within the cavity of at least one chamber of the heart in 47 instances. The clot was attached to the wall of the left ventricle in all but 4 cases, in which it was confined to the right ventricular wall. Forty-eight infarcts were observed in organs other than the heart, namely, 19 in the lungs, 11 in the kidneys, 6 in the spleen, 4 in the brain and 8 at other sites. It was possible only in a few cases to account for the infarcts observed in the other organs on the ground that they were the result of embolism from the endocardiac clot. It would appear that they were the result of local arterial thromboses. Clinical notes were available in only 83 of the 100 fatal cases of cardiac infarction. Seventeen of the 83 patients died too soon for any possible effect to have been produced if anticoagulants had been used. It appears likely that anticoagulants would have served a significant purpose in 37 of the remaining 66 patients. The 100 patients all died before the twenty-first day after the onset of their symptoms, so that it appeared essential to continue the administration of suitable coagulants at least until the end of the third week of illness. With this end in view dicumarol® was administered to 35 patients, 30 men and 5 women, with cardiac infarction. The plan of management was to maintain the prothrombin level between 15 and 40 per cent for twenty-one days. Three patients died before this level could be obtained, i.e., within seventy-two hours after treatment was instituted. Two patients died while under control with the anticoagulant. Thirty patients recovered without the recognition of any thrombotic or embolic complication. The only conclusions possible from this small series of cases are that it is safe to use the drug in such cases when adequate control is possible and that there are few thrombotic complications to be anticipated.

Nordisk Medicine, Stockholm

43:363-402 (March 3) 1950. **Partial Index**

*Struma Lymphomatosa. J. Lange.—366.
*Angina Pectoris and Anginoid Pain. O. Jervell and L. Eitinger.—p. 369.
Berger's Flocculation Reaction in Routine Diagnosis of Syphilis. B. Magnusson.—p. 371.
Effect of Typhoid Vaccination on Body Temperature, Sedimentation Reaction and Wassermann Reaction. T. Romanus.—p. 376.
Vaccination Against Diphtheria in Bergen School Children: After-Examination. K. Schnitler and A. Wormnes.—p. 379.
Treatment of Disseminated Sclerosis with Adrenocorticotropin (ACTH, Cortrophin). B. Jönsson, G. von Reis and E. Sahlgren.—p. 380.
Serofibrinous Pleurisy in Infant Due to Lymphosarcoma of Thymus. N. Tunestam.—p. 382.

Struma Lymphomatosa.—Lange states that struma lymphomatosa (Hashimoto's disease), which usually occurs in women aged between 40 and 60, may occur in younger women and only exceptionally in men. Without preceding symptoms, a firm tumor of the thyroid the size of a moderately large goiter develops in the course of weeks or months. Differentiation between struma lymphomatosa and malignant goiter is important. In the former both lobes are as a rule affected simultaneously if not equally. In the latter the surface is uneven in contrast to the smooth surface of the former. Struma lymphomatosa and Riedel's struma are now regarded as separate entities. Riedel's struma has an iron-hard consistency and is characterized by perithyroiditis; usually one lobe is affected, and the basal metabolic rate is normal. Three cases of struma lymphomatosa are reported in women aged 46, 57 and 21 who were observed five weeks to three months before admission and were then given combined surgical-radiologic treatment. In 2 cases the basal metabolic rate was slightly increased, in 1 it was reduced. The patients are well five and a half, two and a half and two years after treatment. The absence of hypothyroidism, which according to the literature is often seen after surgical intervention, is ascribed to the roentgen treatment, which destroys the lymphocytic infiltration. The pathologic process is believed to develop in and be limited to the thyroid gland. Whether it is inflammatory (on the basis of some toxic action) or due to an abnormal functional condition is not known. The favorable action of roentgen radiation is thought to be of a functional nature and does not exclude abnormal function of the thyroid epithelium as the actual cause of the disease.

Angina Pectoris and Anginoid Pain.—Jervell and Eitinger say that in the angina pectoris syndrome an individual pain threshold that varies must be taken into account. To eliminate the "nervous" factor the patient's way of life must be regulated. Dietetic treatment often favorably effects anginoid pain. In patients with angina pectoris and gallstones improvement has been seen after cholecystectomy. Treatment of spondylolysis and other disorders in the cervical and thoracic column is also important. Roentgen therapy of the cervical and/or thoracic column gave good results in 38 of 79 patients, uncertain effect in 30 and no improvement in 11. In 64 cases the trigger areas common in angina pectoris were given short wave therapy with good effect in 37, uncertain effect in 14 and no effect in 11. Injection of procaine or dibucaine in trigger areas gave good results in 5 of 8 cases. Physical therapy is thought to have been advantageous in many instances. Glyceryl trinitrate cannot as a rule be dispensed with. In some cases application of agents with more protracted effect, such as mannitol nitrate and erythrol tetranitrate, may be useful. Methylthiouracil and propylthiouracil were given in 40 cases, with seemingly good effect in 19. Methylthiouracil is believed to be worth trying when there are no contraindications (hypothyreosis, adipositas, hypercholesteremia?). Angina pectoris is a syndrome without a uniform anatomic basis. The functional component in many cases is important in the development of the pain; effort must be made to find and to eliminate this factor.

Tuberkulosearzt, Stuttgart

4:125-184 (March) 1950. **Partial Index**

*Type of Causative Agent and Course of Primary Tuberculous Infection in Man. O. Koch.—p. 125.
Tibione (Thiosemicarbazone Preparation) in Inhalation Therapy of Open Pulmonary Tuberculosis. H. Scholtze and W. Ried.—p. 138.
Fundamentals of Present Day Internistic-Medicinal Combination Therapy in Pulmonary and Pleural Tuberculosis. H. Ubde.—p. 145.
Cobalt Compounds in Therapy of Pulmonary Tuberculosis (Preliminary Report). W. Glauner.—p. 160.

Causative Agent and Course of Primary Tuberculous Infection.—Koch studied patients at the Pathologic Institute of Düsseldorf during the years from 1947 to 1949. He attempted to determine the incidence of infection with the bovine type bacilli; the localization of the primary focus in infection with the human and the bovine type of bacilli; and the developmental tendencies in these two types of infection. Type determinations were successful in 33 of the cases examined. Tubercle bacilli of the human type were detected in 25 and of the bovine type in 8 of the 33 primary foci. Of the 25 patients with the human type of baccillus 2 were recovering, 18 died of a generalized tuberculosis, 1 of a tuberculosis of an isolated organ and 4 experienced repeated exacerbations with localization in certain organs and with a general dissemination. It appears that with the human type of tubercle bacilli the combined intestinal and pulmonary infection had a very unfavorable prognosis; all of these 3 patients died following dissemination of lesions. The bovine type of tubercle bacillus was detected in 4 of the 23 pulmonary, in 3 of the 6 intestinal and in 1 of the pulmonoenteric double infection. Of the 8 patients with bovine infection 2 were healing and 6 died as the result of the general spread. The 2 patients with bovine infection who recovered showed a typical primary enteric complex. The 4 infections with the bovine type in which the primary focus was in the lungs all terminated fatally after dissemination, showing that a pulmonary primary infection with bovine bacilli had an unfavorable prognosis. It appears in general that the localization is a more decisive factor of the course of a tuberculous infection than the type of bacilli.

BOOK NOTICES

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

Human Growth: The Story of How Life Begins and Goes on; Based on the Educational Film of the Same Title. By Lester F. Beck, Ph.D., Associate Professor of Psychology, University of Oregon, Eugene. With the Assistance of Margie Robinson, M.A. Cloth. $2. Pp. 124, with illustrations. Harcourt, Brace and Company, Inc., 383 Madison Ave., New York 17, 1949.

A companion piece for the popular film by the same title, although neither is actually required to supplement the other, this volume covers the subject in somewhat greater detail. Intended, as is the film, for the sixth to eighth grade age levels, it describes in simple, readily understood language how human growth begins and continues to maturity. There are detailed explanations of the physical changes that occur during adolescence. Discussion of emotional or moral aspects is not included. The chief aim of the volume is to acquaint the reader with factual data on the anatomy and physiology of growth, and it can be said that this is done entirely adequately.

A helpful feature of the volume is the inclusion of a set of questions and answers at the end of each chapter. These are actual questions that were asked by children after they had seen the film and read the book, and realization of this fact should stimulate the new reader to discuss the subject frankly with parents or teachers. Avoiding too detailed discussion, the book covers the subject compactly yet adequately in 4 chapters, the first on the growth process, the second on attainment of physical maturity, the third on parenthood status and the fourth on growth of the impregnated ovum and birth. Generously illustrated, the volume can be recommended to parent-teacher organizations as well as school administrators and serves as an excellent source of data for physicians who may be called on to give talks to lay groups on this subject.

Medizinische Psychologie. Von Ernst Kretschmer, Dr. med. Dr. phil. H.C. O. Professor für Psychiatrie und Neurologie in Tübingen. Ninth edition. Half-cloth. Price, $5. Pp. 257, with 23 illustrations. Georg Thieme, Diemershaldenstrasse 47, Stuttgart-O; imported by Grune & Stratton, 381 4th Ave., New York 16, 1947.

This book, primarily intended for orientating the medical student and general practitioner in medical psychology and psychiatry, contains an exposition of Dr. Kretschmer's theory of psychology interwoven with functional neuroanatomy and neurophysiology. He takes up such questions as body and psyche, their definition and relations, self and environment, spirit and matter. He traces the development of affect, methods of expression, symbolization and abstraction. He describes the various body types and the various personality reaction types. At the end of the book, the author added a section on various forms of therapy with a brief description of each method and his opinion as to its applicability, emphasizing particularly his treatment method, which combines elements of psychoanalysis, Jacobson's progresisve relaxation, conditioned reflex training, hypnosis and education.

Although the book is well written in a clear style, it would be of little interest to American readers as it contains nothing which is not otherwise available in the American literature; the author's theories of constitution and body types are described in previously translated works.

The Characteristics of Electrical Discharges in Magnetic Fields. Edited by A. Guthrie, Ph.D., and R. K. Wakerling, Ph.D. National Nuclear Energy Series, Manhattan Project Technical Section, Division I-Volume 5. Cloth. $3.50. Pp. 376, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 18; Aldwych House, Aldwych, London, W.C.2, 1949.

This book consists essentially of eleven technical papers. These papers report experiments designed to analyze the distribution of particles and forces in vacuum tubes (at pressures generally near 0.002 mm. of mercury) when an electric arc was influenced by a magnetic field. The book is of value to electrical engineers and mathematical physicists.

Psychotherapeutische Studien. Von Ernst Kretschmer, Prof. Dr. med. Dr. phil. H.C. Cloth. Price, $4.25; 13.50 marks. Pp. 215, with 5 illustrations. Georg Thieme, Diemershaldenstrasse 47, Stuttgart-O; imported by Grune & Stratton, 381 4th Ave., New York 16, 1949.

This is a well written, easily read 200 page book, explaining the author's theories of psychotherapy based on his concepts of constitutional psychology. The treatment method which he describes is a combination of modified analysis, Jacobson's progressive relaxation, hypnosis, conditioned reflex training and education. Some of the criticisms of psychoanalysis which he makes are felt to be outdated and no longer valid. Of course, in his concept of psychiatry, constitutional factors play a much larger role than emotional ones; the author states that in his opinion many of the early emotional experiences that are worked through in psychoanalysis are nothing but early sign posts of constitutional defects and should be evaluated only as such. He feels that most psychic disturbances classified as neurotic are based on partial retardation in physical maturation during special crisis periods. Thus his therapy frequently includes the use of hormones. Whatever emotional stage the patient happens to be in when he is affected by one of these retardations, that will be the pattern that he will carry into adult life, and the author believes that many patients, when physical maturation finally catches up and becomes harmonious again, recover from their neurosis on that basis. He develops the point of view that, since the emotional tone, the somatic tone and the vegetative tone are all regulated by centers that are close to one another, one can be influenced by the other and that there is no reason to attack psychiatric problems only through the emotional approach but that progressive relaxation training with its affect on vegetative and somatic tone can also correct difficulties in the emotional sphere. He makes the comparison that a neurotic patient is like a stream with big rocks in it at low water level in which a boat cannot navigate, but if through these other means one can influence the emotional tone, i. e., the water level, so that it rises a boat can then ride over these boulders without danger. In other words, these complexes and emotional problems do not have to be explored to cure the patient. He also compares neurotic patients in treatment to a garden path overgrown with weeds. In analysis each weed is cut out individually, whereas the author's therapy mixes salt with the soil so no further weeds can grow in it. In relation to this theory, he emphatically states that the usual view that constitution is fate and unalterable is not correct and that the constitution by his training methods of progressive relaxation and conditioned reflex training can be altered. His treatment of neurosis is of about two months' duration, consisting of daily, analytically oriented sessions to discover emotional conflicts, during which time association experiments and dream analysis may be used.

During the second part of treatment, these sessions are utilized in what the author calls psychic education, in which the therapist, together with the patient, attempts to define the patient's capabilities and limitations and help him to plan his future aspirations. Concurrent with this therapy, progressive relaxation is instituted with emphasis on this being a job for the patient which he must learn; the author is quite free in whether he uses only this relaxation method or whether he leads on into hypnosis for investigative purposes or uses the hypnotic stage when reached to impress on the patient important briefly and clearly formulated knowledge gained from the analytic sessions. He brings out that his therapy is varied according to the patient and that a patient of low intelligence will receive primarily relaxation and conditioned reflex training, whereas a more intelligent patient will receive more of the analytic type and less hypnosis and almost no conditioned reflex training.

The author repeatedly stresses the point that he has removed from hypnosis its cloak of magic and also most of its suggestiveness. He states that by taking it apart into its components and studying the mechanism of each, it is possible to know what goes on at each stage. By making the patient an active participant, the old drawback of the patient's being the passive recipient of some magic from the doctor can be removed.

In his analytic treatment, the author stresses the importance of abreaction, although at one point he notes the fact that material produced under hypnosis often does not produce a real abreaction. He also utilizes hypnosis to train patients in associative thinking, especially those with obsessive and compulsive states, feeling that in this way the analytic sessions are helped greatly.

One real drawback of this book for American readers is the sparcity of case material presented and the brevity of the few cases that are included.

The Arthropathies: A Handbook of Roentgen Diagnosis. By Alfred A. de Lorimier, M.D., Radiologist, Saint Francis Hospital, San Francisco. Second edition. Cloth. $7. Pp. 335, with 157 illustrations. The Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1949.

The reasons for the revision of this handbook as stated by the author are, first, to provide new reproductions without the wavy arrows conspicuous in the first edition, and, second, to include generalizations descriptive of each entity. The original outline has been followed with the preparation of descriptions of the roentgen features, the soft tissues, regional bones, articular cortices and joint spaces. The book is divided into three sections: peripheral joints, joints of the spine and the temporomandibular joints. The normal development, malformations and pathologic changes of these joints are discussed.

The book is printed on good paper, and the type is easy to read. The reproductions of the films are excellent, and the pathologic changes are clearly marked by arrows. Each plate is described in detail, and the roentgen features characteristic of each disease are noted. There are a number of reproductions of histopathologic slides. These are discussed in correlation with the roentgen plates, adding to the clarity of the disease entity.

The effectiveness of the book might have been enhanced if the author had chosen to follow the classification adopted by the American Rheumatism Association and the Standard Nomenclature of Disease rather than a classification based on etiologic factors, since the causes of many of the diseases discussed are still unknown. The numerous synonyms listed under various disease entities add little valuable information and could well have been omitted. However, the handbook should prove useful to persons who are interested in the roentgen findings of joint disease.

Jewish Artists of the 19th and 20th Centuries. By Karl Schwarz. Cloth. $4.75. Pp. 273, with 48 illustrations. The Philosophical Library, Inc., 15 E. 40th St., New York 16, 1949.

It is only in the last hundred and fifty years that artists of Jewish extraction have begun to exert influence in the world of art. This emergence of Jewish artists was coincidental with the liberalizing social influences of the French Revolution on the political life of Europe.

Deftly the author depicts the artist suddenly freed from the confining ritualistic and rationalistic life of the ghetto into an outer world with standards of appreciation of beauty and modes of expression far beyond those found in Jewish life. Hitherto, the Jewish artist had been limited in his expression to basreliefs appearing on tombstones and to miniature portraits. Timidly, he began to use the mediums of expression he saw about him, at first rigidly adhering to accepted teachings and then gradually expressing himself in more and more forms of his own invention.

The objectives of the text are merely to present high points in this awakening. Obviously, the selection of artists reviewed is limited by the size of the text and, therefore, consideration is incomplete. However, as a general survey, as an indication of a turning point in the history of the Jewish people and as an explanation of the sudden emergence of Jewish artists, the book serves its purpose.

Vitaminology: The Chemistry and Function of the Vitamins. By Walter H. Eddy, Ph.D. Cloth. $6. Pp. 365. The Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1949.

Dr. Eddy is one of the pioneers in the field of vitamin research, and the many excellent books written on this subject by him in the past thirty years attest to his interest and ability in this important branch of nutrition.

The present book contains in one volume a comprehensive survey of the entire field of vitaminology. The first few pages discuss the history and definition of vitamins, and the remainder of the book is devoted to a discussion of each of the known vitamins and some of the postulated vitamins. The chapters on the individual vitamins are divided into three sections: the functions of the vitamin; the chemistry of the vitamin, and its value in human and domestic animal nutrition. For those readers who may want more detailed information, each of the sections is thoroughly documented with references to original articles.

The author writes clearly and concisely, and the text is easily understood. Attention is called to the somewhat misleading way of indicating $>CH_2$ as $>C=H_2$ in many of the structural formulas, thus leading one to believe at first glance that a true double bond is indicated, whereas such is not the case. Also, on page 89, the structural formula for synthetic vitamin K (2 methyl-1,4-naphthoquinone) is incorrect.

Although this textbook was primarily designed for use by teachers of biochemistry, the physician who desires a basic and up-to-date discussion of the vitamins in one volume will find this book of real value.

Medical State Board Questions and Answers. By R. Max Goepp, M.D., and Harrison F. Flippin, M.D., Associate Professor of Medicine at the Graduate School of the University of Pennsylvania, Philadelphia. Eighth edition. Cloth. $7. Pp. 663. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1950.

The qualifications of the joint authors of this volume are excellent. The addition of Dr. Flippin is evidence of the desire of the original author to insure continuation of high standards of the book. This edition has been brought up to date and is a valuable reference book for those physicians who are obliged to take state board examinations after being out of school for several years. This has been the objective of the author in all preceding editions. The authors have included in this volume a complete coverage of the subjects taken up in state board examinations, paying special attention to the new developments in medicine, especially in the realms of therapy, both medical and surgical. It is well arranged with readily available table of contents and index. The printing is legible. No illustrations, plates or bibliographies are included. All 595 pages are used to answer briefly but completely the questions most commonly asked on state board examinations. Careful appraisal of the volume convinced the reviewer that this is a most valuable volume for the applicant for examination for licensure. Apparently, the authors have reviewed large numbers of examination questions of the various boards in recent years. The only questions not covered in this volume are those in which the reasoning of the applicant is being investigated. These questions are highly important in gaging the ability of the applicants and are being used increasingly.

The Third Mental Measurements Yearbook. Edited by Oscar Krisen Buros, Director of the Institute of Mental Measurements, School of Education, Rutgers University, New Brunswick, N. J. Cloth. Price, $12.50. Pp. 1047. Rutgers University Press, New Brunswick, 1949.

This review of published tests is excellently conceived and constructed. Although there is some overlapping, the various tests and measurements are well classified into such categories as tests of English, fine arts, intelligence, mathematics, and others. In addition to statements regarding the construction of these tests and their uses, an evaluation is given of them in terms of validity and value.

This book is almost a "must" for psychologists and educators but should also be of great value to those physicians who deal with the psychologic problems of children and adults and who want a ready reference to the kinds of tests used and their values.

QUERIES AND MINOR NOTES

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

DISINFECTING THE AIR

To the Editor:—**In a recent answer to a question about disinfecting the air, there was no mention of a procedure which is being advertised highly and with a flood of literature by mail. Is the "Glycolaire Purifier" or any of the other vaporizers that use some form of glycol of any significant use?**

G. T. Blydenburgh, M.D., Delaware, Ohio.

ANSWER.—Under experimental conditions the presence of certain glycol vapors in living quarters, dormitories and hospitals can reduce the incidence of air-borne disease and cross infections, but persons who spend only part of their time in such an atmosphere cannot expect it to confer immunity against exposure to infection in other places. The general, constant use of disinfectant vapors in schools, barracks and specialized industrial environments is not justified at the present time; neither is there justification for indiscriminate use of such vapors in homes, offices or places where persons congregate freely.

PAIN IN PENIS AND PERINEUM

To the Editor:—**Kindly give some information about a pulsatile needle-like pain that occurs simultaneously in the glans penis and perineum, about every two weeks and that takes twenty-four hours to subside. The urine is normal, and there are no clinical symptoms or signs indicating kidney or bladder infection, e. g., stone, pus or tuberculosis.**

William J. Macdonald, M.D., Boston.

ANSWER.—Intermittent pulsatile needle-like pain in the glans penis and perineum is not significant of any specific organic lesion. Symptoms of that type sometimes occur with chronic prostatitis, prostatic calculi or prostatic carcinoma. The possibility of a small stone in the bladder or lower part of the ureter or in the urethra should be excluded by a roentgenographic and cystoscopic examination of the urinary tract. Although the pain could be of a functional nature, the possibility of organic disease must be excluded. To rule out a lesion in the nervous system, a complete neurologic examination including study of the spinal fluid might be made.

VINYLITE

To the Editor:—**Is vinylite® resin XYHL, manufactured by Bakelite Corp., toxic when applied to a skin wound, as a saturated solution in isopropanol?**

M.D., Pennsylvania.

ANSWER.—This plastic is polyvinylbutyral resin. It is made from polyvinyl alcohol and butyraldehyde. The reaction is of the aldol type. The end result is a solid, tough, horny, resinous material with a high degree of polymerization. As such, it is not known to be irritating. Isopropyl alcohol is a well known constituent of rubbing compounds and is near universal to some types of cosmetics. Likewise, it is seldom irritating. Only exceptionally may any chemical damage appear.

STERILIZATION OF CATHETER

To the Editor:—**During autoclave sterilizing of the catheter (which is used for continuous spinal anesthesia), may or may not the wire stilet be left inside the catheter?**

K. S. Ting, M.D., Chicago.

ANSWER.—During autoclave sterilizing of continuous spinal and caudal catheters, the wire stilet should not be left in the catheter. The purpose of the stilet is to clean the catheter and to test its patency. The purpose of steam sterilization is to bring the live steam in contact with all surfaces. The stilet would naturally hinder this process.

DIATHERMY AND DIABETES

To the Editor:—**Is the use of diathermy or infra-red heat therapy contraindicated in the treatment of fibrositis in a patient with uncomplicated diabetes mellitus?**

M.D., New York.

ANSWER.—Caution must be used in applying heat to any part of the body that is unable to respond by vasodilation. This possibility must be considered in the diabetic patient. In the absence of a complicating arteriosclerosis, however, diabetes is not a contraindication for the use of diathermy or of infra-red radiation.

TREATMENT OF NEPHROTIC SYNDROME WITH MEASLES

To the Editor.—**What is the value in the treatment of the nephrotic syndrome of nephritis with measles? If it is efficacious, what is the method of infection, and what, if any, are the contraindications?**

Henry F. Cooper, M.D., St. Louis.

ANSWER.—It has long been known that a variety of acute infections may produce striking remissions and occasional cures in the nephrotic syndrome, particularly in the so-called pure nephrosis without hypertension, hematuria or renal impairment. An attack of measles seems to be most efficient in this respect. The literature on this topic is reviewed by R. W. Blumberg and H. A. Cassady (*Am. J. Dis. Child.* 73:151, 1947), who reported 5 cases of nephrotic syndrome in which measles developed while the patients were under hospital observation. In the 2 children with pure nephrosis, spectacular diuresis and loss of edema occurred during the eruptive phase of measles. The results were much less striking in the 3 children with the nephritic type of nephrosis. C. A. Janeway and associates (*Tr. A. Am. Physicians* 61:108, 1948) deliberately inoculated 12 children who had nephrotic edema by nasal instillation of throat washings from patients in the Koplik spot stage. They made no attempt to modify the measles but used penicillin in full dosage and at times a sulfonamide drug or streptomycin to prevent the secondary complications of measles. Again the most striking beneficial results were observed in the children with pure nephrosis. No cure was observed, but some of the remissions lasted for months.

The decision to expose a nephrotic child to an infection of measles should be made only after thorough consideration of the severity or stubbornness of the nephrosis, the degree of renal impairment, the general condition of the child (especially his nutritional state) and an appreciation that there is still some risk involved even with the use of antibiotics. The fact that the nephrotic phase of nephritis does not respond nearly as well to measles as does pure nephrosis limits the value of this treatment considerably. It must also be borne in mind that the treatment cannot be repeated for obvious reasons. Other susceptible children in the family would have to be protected by means of human measles immune serum.

YEAST IN GASTROINTESTINAL TRACT

To the Editor:—**What yeast forms found in the stool are considered pathologic? What is the procedure to follow when a specific form of yeast in the stool is to be isolated and identified? What treatment is indicated for the yeast forms that are considered pathologic in the stool?**

M.D. Missouri.

ANSWER.—Among yeast fungi, the only species known to be pathogenic for man is Candida albicans. Several diseases, including pernicious anemia, sprue and psoriasis, have been attributed in the past to infection of the gastrointestinal tract with yeast fungi. At present, no systemic disease or diseases of the gastrointestinal tract are considered to be caused by such an infection, and recovery of yeast forms from stool cultures is not considered pathologic unless the organism is also identified in, and recovered from, the tissues of the gastrointestinal tract. Nonpathogenic and pathogenic yeasts are inhabitants of the gastrointestinal tract in a considerable proportion of the population. In one series C. albicans was recovered from 18 per cent of the stools of 100 normal young adults (Benham, R. W., and Hopkins, A. M.: Yeastlike Fungi Found on the Skin and in the Intestines of Normal Subjects, *Arch. Dermat. & Syph.* 28:532, 1933).

Isolation of a fungus from the stool can be accomplished by touching poured plates of glucose agar (Sabouraud's medium) at several points with a platinum loop repeatedly touched to the specimen. Incubate at room temperature and at 37 C. After four days the suspected colonies are transferred to glucose agar slants. Identification of a yeast is a difficult procedure involving use of several differential mediums and fermentation reactions. These procedures are outlined by N. F. Conant and others (Manual of Clinical Mycology, Philadelphia, W. B. Saunders Company, 1944, chapter 8).

C. albicans is usually identified by the presence of large chlamydospores in culture mounts from colonies growing on cornmeal agar slants. Systemic infection with C. albicans, also called systemic moniliasis, is an extremely grave condition, and its treatment is highly unsatisfactory. The carbohydrate metabolism in these patients is often abnormal and should be investigated (Rothman, S.: *Tr. New York Acad. Sc.* 12:27 [Nov.] 1949). Any disorders should be corrected. Nutritional deficiencies also may play a role in the pathogenesis and should be corrected. Iodides, methylrosaniline chloride, vaccines and immune serums have been recommended for treatment but have been of little or no value in the writer's experience.

FREEZING TO DESTROY TRICHINAE

To the Editor:—**Several of my patients stated that they would like to eat bacon or ham uncooked, if it could be done without danger from trichinosis. I understand that deep freezing will destroy the larvae. Please advise temperature and time necessary to make pork safe for consumption, without cooking, by storing the pork in a deep freezer.**

M.D., Wisconsin.

ANSWER.—The prescribed treatment of pork and products containing pork to destroy trichinae (Regulations Governing Meat Inspection of the U. S. Department of Agriculture, ed. 1947; Section 18.10 [*c*] [2]) includes subjection of the product to the following freezing temperatures and times:

Temperature	Time	
	Group 1	Group 2
+ 5 F	20 days	30 days
−10 F	10 days	20 days
−20 F	6 days	12 days

Group one comprises products not exceeding 6 inches (15.24 cm.) in thickness or stored in racks with the layers not exceeding 6 inches in depth. Group two comprises products greater than 6 inches but not exceeding 27 inches (68.6 cm.) in thickness. All parts of the product must be subjected continuously to temperatures not higher than one of those specified and for the time specified or longer.

If there is any doubt at all about the length of time and the temperature at which pork has been stored it should be thoroughly cooked before eating.

BLEEDING DISEASE IN A MAN

To the Editor:—**A white man aged 55 years has the following complaints: (1) Severe, prolonged, bleeding following removal of a small growth on an eyelid five years ago; several episodes of excessive bleeding lasting several days, following dental extractions in the past five years. (2) Bruises easily; history of working for the past two years with trichloroethylene heated with steam to produce vaporization. The history is otherwise noncontributory. There is no history of bleeding in the family. Blood studies Feb. 19, 1949 revealed that the bleeding time was 2 minutes and coagulation time 5½ minutes with 7,600 white blood cells, 5 million red blood cells, irregular in size and some extremely large. On Feb. 10, 1950, there were 9,000 white blood cells and 4.9 million red blood cells, with a differential count of eosinophils 2 per cent, band cells 5 per cent, segmented cells 75 per cent, lymphocytes 15 per cent and monocytes 3 per cent. The hemoglobin was 95 per cent and the color index 0.9. What is the diagnosis and treatment?**

M.D., Michigan.

ANSWER.—This query states that the exposure to trichloroethylene originated two years ago but that the bleeding disease was present some three years earlier. Manifestly, trichloroethylene is an unlikely proximate cause. Moreover, the manifestations of trichloroethylene poisoning are foremostly directed to the central nervous system. Infrequently, however, liver or kidney damage may appear. Since bleeding diseases may be associated with hepatic damage, liver function tests may be in order. The bleeding phenomena, but not results of blood chemical studies, suggest benzene poisoning. Trichloroethane, another chlorinated hydrocarbon, may produce widespread hemorrhage after exposure, but this substance is little used in industry because of its high degree of toxicity. The manifestations reported in the present instance suggest the possibility of a secondary purpura attributable to vitamin deficiency, notably ascorbic acid and vitamin P. If this particular variety of symptomatic purpura may be eliminated, examination should be directed to other forms of hemorrhagic disorders. The Rumpel-Leede test for capillary fragility or increased permeability should be conducted. On the skin of the flexor forearm, a 1 inch (2.54 cm.) circle should be marked and any pink, purple or yellow spots therein should be noted. A blood pressure cuff should be kept inflated at a point midway between diastolic and systolic pressures and for a period up to fifteen minutes. New petechiae in numbers above ten are significant.

BURNING VAGINAL DISCHARGE

To the Editor:—**A woman has a burning, itching discharge from her vagina. The cervix seems normal. She is 44 years of age, her menses are every twenty-one days and she flows profusely. I am afraid to give her hormones because of the profuse bleeding. What should be used?**

James O. Helm, M.D., New Florence, Mo.

ANSWER.—The symptoms are suggestive of infection due to Trichomonas vaginalis. Wet smear (the patient should be advised not to use a douche beforehand) of some of the material with isotonic sodium chloride solution usually shows the organisms.

A good treatment is the twice daily insertion vaginally of floraquin® suppositories (contain 100 mg. diiodo-hydroxyquinoline per vaginal tablet) preceded by a weak (1 teaspoon to 2 quarts) lactic acid douche. After two weeks, treatment can be given once daily at night. Later, the treatment can be cut still more except that when menstruation occurs, the suppositories should be used twice daily but douches should not be taken. By patience and long continued therapy one is usually rewarded with a cure. Other causes of the itching and burning must be considered, such as diabetes, irritation from urinary incontinence and yeast infection.

In a woman aged 44 investigation of the cause of the profuse bleeding would seem to be of equal importance with clearing up the discharge. Cancer sometimes produces such a discharge. After the foregoing treatment has been completed the patient should have a thorough pelvic examination and probably a diagnostic curettage.

PROGRESSIVE ALOPECIA

To the Editor:—**What is the most probable cause of generalized progressive alopecia in a healthy young white woman aged 22? Physical examination reveals no abnormalities. The patient is not excessively emotional. The scalp tends to be excessively oily with rather greasy scales. The color of the hair is blonde. This process has been going on for the past two and a half years. If seborrhea is due to a micro-organism is it conceivable that an intensive course of antibiotic therapy would be of value? I realize the full possibilities of sensitization, but might local applications of ointments containing a sulfonamide drug or penicillin be effective?**

M.D., Pennsylvania.

ANSWER:—Apparently the patient has alopecia associated with seborrhea and seborrheic dermatitis, a condition observed more commonly in men. Unfortunately, in the light of present knowledge, although the condition can be controlled successfully it cannot be eradicated; the patient will have to accept that fact, however reluctantly. Infection, heredity, endocrine imbalance and perhaps unknown factors all seem to play a role in the development of such conditions, and the reason for the variety of treatments mentioned in dermatologic textbooks is that they are all effective in some cases but not in all. Intensive systemic therapy with antibiotics is ineffective, and the topical application of sulfonamide drugs and penicillin, though it may be temporarily effective, is not ordinarily recommended because of the danger of rendering the patient hypersensitive to these drugs. Usually a combination of sulfur and salicylic acid in a suitable base is applied until the scaling is eradicated, then the application of a scalp lotion effectively controls the condition. All textbooks provide formulas for such scalp lotions.

ARTIFICIAL PNEUMOTHORAX

To the Editor:—**I desire information on the physiologic and anatomic effect of temporary collapse of the lung that is produced when pneumothorax is used as a therapeutic measure in pulmonary tuberculosis. I would like to know how long it is necessary to maintain a successful pneumothorax in order to obtain the desired results.**

Edward W. Hayes, M.D., Monrovia, Calif.

ANSWER.—There is no permanent anatomic effect on a lung in simple pneumothorax. The temporary effect is a partial collapse of all the structures, including alveoli, bronchi, bronchioles, blood and lymph vessels. The physiologic effect is, first, to slow down the circulation of blood and lymph roughly in proportion to the amount of collapse. A later effect, after several months of collapse, is the development of a mild compensatory polycythemia.

In most patients treated with pneumothorax, however, fluid usually forms in the pleural cavity wherein the pleura is thickened by a laying down of fibrous tissue, and the trabeculae in the lung become thickened because of inflammation so that there is always more fibrous tissue than in a normal lung. The time a collapse is to be maintained depends on the amount of diseased tissue to heal. An early, moderately advanced infiltrative lesion, with or without a small cavity, usually requires two or three years to heal. A larger involvement with cavities may require five to six years. If any longer time is required, other forms of surgical treatment should probably be used.